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WEED ABSTRACTS

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NOTES FOR READERS

Weed Abstracts endeavours to provide a comprehensive coverage of the world's literature on weeds, weed control and closely allied subjects. To this end, over 370 journals and nearly 100 annual reports are regularly searched. Other journals, reports, bulletins, etc. are abstracted as they are seen. Additional coverage is obtained through agreements with other abstracting organisations.

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As far as possible the journal abbreviations used are those given in the World List of Scientific Periodicals. Holding libraries in Oxford and elsewhere are also taken from the World List, e.g. O.BO = Botany Department, Oxford. Numbers at the end of abstracts, e.g. 75(492) are for internal use only.

When a paper is by more than one author, the address of the first author only is given.

Where an abstract is taken from an abstracting journal the acknowledgement follows the abstract, e.g. Herb.Abstr., 2,163. Where it is quoted only in part the acknowledgement is preceded by the word "from", e.g. From Biol.Abstr., 2,294.

The Information Section is always pleased to receive comments and suggestions for the improvement of Weed Abstracts.

* An asterisk before the author's name indicates that only the title of the paper has been seen.

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ac	- acre(s)	in.	- inch(es)	p.s.i.	- pounds per square in.
a.e.	- acid equivalent	kg	- kilogram(s)		
a.i.	- active ingredient	l	- litre(s)	v/v	- volume/volume
cm	- centimetre(s)	lb	- pound(s)	w/v	- weight/volume
d.b.h.	- diameter at breast height	m	- metre(s)	w/w	- weight/weight
		ml	- millilitre(s)	>	- greater than
ft	- foot(feet)	oz	- ounce(s)	<	- less than
g	- gram(s)	post-em.	- post-emergence	#	- pounds per acre
gal	- gallon(s)	pre-em.	- pre-emergence	±	- with or without
ha	- hectare(s)	p.p.m.	- parts per million		

Language abbreviations: an initial capital denotes the language of the article, a small letter that of the summary: - Dan. - Danish, Du. - Dutch, E. - English, F. - French, G. - German, It. - Italian, Jap. - Japanese, Nor. - Norwegian, Russ. - Russian, Span. - Spanish, Sw. - Swedish.

633. ZINGG, A.W. and WHITFIELD, C.J. A summary of research experience with stubble mulch farming in the Western States. Tech. Bull.U.S.Dep.Agric., 1957, 1166, pp.56, figs.9,tabs.24,bibl.31.
Includes a brief indication of weed problems encountered with stubble mulch tillage. Bromus tectorum was the most serious weed and its infestations increased as the humidity of its environment increased. In semi-arid regions, B. tectorum and other annual weeds caused little trouble where a wheat/fallow rotation was used; with this rotation, the weeds were controlled effectively by sub-surface tillage using sweeps. In eastern portions of the semi-arid regions, weed control under continuous wheat was difficult and in sub-humid parts of Oklahoma, infestations with B. tectorum became serious under this system, especially after years when September rainfall was low. In Nebraska and Oregon (sub-humid regions), a reasonably good level of control of B. tectorum was secured by secondary tillage with a skew-treader after sub-surface tillage. - P.J.B. [63(75.3)]

634. LIN' BAO. [Effect of moldboard and moldboardless tillage of chernozems on weediness and yield of agricultural crops.] Dokl.s.-kh.Akad.Timiryazeva, 1960 53, 75-83, (Russ.)
Moldboardless tillage after stubble crops resulted in more annual, biennial and perennial weeds in the next crop. After maize the method of tillage did not affect weediness immediately, but prolonged moldboardless tillage increased weediness greatly. Moldboardless loosening of the bare fallow and subsequent disking decreased weediness compared with ordinary plowing. The yields of spring wheat and maize after moldboardless tillage of stubble crops was somewhat less than after autumn moldboard plowing. The yields of oats after maize and of winter wheat after bare fallow were not affected by the method of tillage. A year after repeated moldboardless tillage or after disking, yields of spring cereals after cereals or maize were decreased by 10-25% compared with the yields obtained after repeated moldboard plowing. Annual plowing to > 20 cm did not increase cereal yields, but maize yields were increased by autumn plowing to 40 cm. - Soils & Fert., 23,(6),2621.

635. PFEIFFER, R.K. and HOLMES, H.M. (Fisons Pest Control Ltd.,Chesterford Park Res.Sta.,Essex,England). A study of the competition between barley and oats as influenced by barley seed rate, nitrogen level and barban treatment. Weed Res., 1,(1),5-18, (E.g.f.), figs.8,tabs.8,bibl.4.
In the trials reported, N treatments used were 0, 45 and 90 kg/ha, broadcast on the seedbed, in combination with each of the following sowing rates of Rika barley: 0, 47, 94, 188 and 376 kg/ha. Each plot was cross-drilled with oats at 62 kg/ha. The oat variety used was Victory, which had shown a degree of susceptibility to barban similar to that of Avena fatua. Barban was applied to all plots at rates of 0.13, 0.2, 0.3, 0.45, 0.67, 1, 1.5 and 2.2 kg/ha in 112 l spray when the barley and oats were in the 2- and 1.5-leaf stage, respectively. Oat shoot numbers and fresh weights (at milk stage) were reduced by 60 and 92%, respectively, as sowing rates increased from nil to 376 kg/ha; oat panicle numbers and spikelets per panicle were also reduced markedly. Increasing rates of N increased the total fresh weight of barley and oats to a similar extent, mostly as a result of higher weights of individual shoots. The % reduction (80% at selective rates) in weight of oats resulting from barban treatment was almost constant at all sowing rates and it was apparent that the effects of crop competition and barban in reducing oat populations were additive only. Decreases in the fresh weights of oat plants were compensated by increases in that of barley, though not entirely at the two lower sowing rates. There was no clear interaction between N and barban treatment, though barban tended to cause greater reduction of oats at the highest level of N and at the higher sowing rates. - P.J.B. [O.W.]

636. KAWATEI, K., KATO, Y. and WACHIDA, H. (Univ.Farm,Tokyo,Japan). [Studies on establishment of a weeding system in field cultivation. III. Influence of weeds in the row on the growth and yield of upland rice plants.] Proc.Crop. Sci.Soc.Japan, 1960, 29,(1),139-42, (Jap.e.)
Weeds in the row have less competitive effect than expected, particularly when weeds between the rows are eradicated. Shading of the crop is more important than competition of roots in the soil, as shown by the greater crop reduction by such rapidly growing weeds as Chenopodium album, Polygonum orientale and Amaranthus blitum. Weeding should be done a few weeks after germination and again at the stage of flower bud differentiation. - Plant Sci., 36,(6),18575.

637. GURCHARN SINGH and SOHAN SINGH SAINI. (Economic Botanist, Punjab, Jullundur, India). Three new purple-leaved strains to help you wipe out wild rice from your rice fields. Indian Fmg, 1960, 10,(3),6-7, figs.2, tabs.2.
In samples taken from 3 methods of rice cultivation - (1) broadcasting under rain-fed conditions, (2) broadcasting of sprouted seeds in puddled field, and (3) transplanting of seedlings - the occurrence of wild rice (Oryza sativa var. fatua) was 12.72% in (1), 7.22% in (2) and 0.01% in (3). Three new purple-leaved hybrid strains - L-12, P-502, and R-575 - have been developed and found very suitable in the Kangra hills for facilitating wild rice eradication by enabling all green-leaved plants to be rogued out. - D.M.L.S. [O.RL.]

638. UNITED STATES, WISCONSIN AGRICULTURAL EXPERIMENT STATION. What's new in farm science. Bull.Univ.Wis.agric.Exp.Sta., 1959, 538, pp.105.
p.38. Amitrole 4 % applied to oats 12-18 in. high reduced yields by less than 20%. Germination of oats from treated plants was not reduced even by higher rates. Application when oats were taller reduced yields slightly more. Lucerne seedlings under treated oats were killed by rates higher than 1 %. - D.M.L.S. [72(77.5)]

639. ROBBINS, P.R. and BAKER, C. Will minimum tillage affect my profits. Misc. Publ.Agric.Econ.Dep., Purdue Univ., 1960, pp.8, tabs.4.
The results of a survey in 1959 of the results of using minimum tillage practices with maize (not more than one discing or harrowing between ploughing and sowing and minimum tillage after sowing) indicated that tillage costs were reduced by $0.40-4.50/ac. Yields were as high or higher than with conventional tillage, soil erosion and run-off were less, soil tilth was improved and the incidence of grass and other weeds was reduced. - P.J.B. [49(77.2)]

640. GRANCINI, P. Ulteriori risultati sul diserbo chimico del mais. [Further results with chemical weed control in maize.] Maydica, 1961, 6,(1),4-22, (It.e.g.), figs.13, bibl.15.
For North Italian conditions of irregular rainfall atrazine is preferable to simazine; simazine, however, gives better control of Digitaria spp. and Setaria sp. Each alone or as a mixture are normally used pre-em. at 2 kg/ha. [Panicum spp.] are easily controlled, especially in early growth. Atrazine is also effective post-em., especially against Amaranthus sp. and Chenopodium sp. It was noted that both compounds controlled green algae. The advisability of cultivation after spraying and the influence of soil texture on herbicidal effect is discussed. Under dry conditions rolling after spraying is advantageous, but not harrowing. - D.M.L.S.

641. UNITED STATES, THE ROCKEFELLER FOUNDATION. (111 West 50th Street, New York, N.Y., U.S.A.) Herbicides. Annu.Rep. Rockefeller Found., 1959-60.
In trials at Cotaxtla, Mexico, during 1959, yields of maize on plots infested only with broad-leaved weeds (mainly Amaranthus spp. and Bidens spp.) yielded only 1114 kg/ha, while on plots infested only with grass weeds (mainly Echinochloa colonum, Eleusine indica and Panicum spp.) yielded 3750 kg/ha. Maize yields were most affected by weed competition during the first 25 days after sowing. In trials to control Mimosa pigra in grassland, a 2,4,5-T formulation was applied to clumps of this weed 15, 30, 45 or 60 days after burning. At 12 months after treatment, best results (96-98% control) were obtained where the herbicide was applied at 45 or 60 days after burning. - P.J.B. [O.W.]

642. STANIFORTH, D.W., SYLVESTER, E.P. and LOVELY, W.G. (Iowa State Coll., Ames, U.S.A.) Weed control in corn. Iowa State Univ.Ext.Pamphl., 1960, 269, pp.8, figs.4.
Recommendations are given for cultural and herbicidal control of weeds in maize, including the use of 2,4-D, CDAA, simazine, atrazine and EPTC, and of granular formulations. - P.J.B. [44(77.7)]

643. QUERINI, O. Gesaprim per il diserbo del mais e del sorgo. [Gesaprim for weed control in maize and sorghum.] Lotta antiparassitaria, 1961, 13,(3),6-7, (It.)
Recommends Gesaprim (atrazine wettable powder 50%) at 4 kg/ha applied pre-em. - D.M.L.S. [72(45)]

644. UNITED STATES, SOYBEAN DIGEST. Giant foxtail vs. corn, soybeans. Soybean Dig., 1960, 20,(6),20.
A fertile silt loam soil known to be infested with giant foxtail [Setaria viridis]

was used to investigate the effects of foxtail competition on soybean yield in 1957 and 1958. The 2-year average yield from plots where all foxtail plants had been removed by hand-weeding was 40.1 bushels/ac. On plots thinned so as to leave foxtail plants spaced 12 and 2 in. apart, average yields were 37.4 and 34.2 bushels/ac, respectively. On an unthinned plot (70 foxtail plants/running ft of row in a band 3-4 in. wide over the rows in 1957 and 28 plants in 1958) the yield was only 26.2 bushels/ac. - J.W.F. [G.R.I.]

645. HAY, J.R. (Plant Res.Inst.,Ottawa, Ontario,Canada). Status of chemical weed control in corn and soybeans. Forage Notes, Canada, 1960, 6,(1),1-3.
Reviews briefly the use of 2,4-D, CDAA, simazine and atrazine in maize and of chlorpropham, dinoseb, NPA, CDAA and CDAA + dinoseb in soybeans. - P.J.B. [243(71)]

646. NATION, H.A. (Dow Chem.Co.,Agric. Chem.Development,Greenville,Mississippi U.S.A.) Pre-plant treatments with dowpon for the control of Johnsongrass in soybean fields. Down to Earth, 1961, 16,(4), 16-17, figs.2,bibl.2.
The results are given of a number of trials in Mississippi which indicated that dowpon (85% sodium dalapon) at 10 lb applied to Sorghum halepense 12-15 in. high before sowing soybeans 3-4 weeks later (5-6 weeks in cool conditions) gave a substantial degree of control of S. halepense early in the season with little injury to the soybean. A rate of 5 lb also gave good results, though on heavily infested fields, a rate of 10 lb was regarded as advisable. The removal of early-season competition from S. halepense considerably increased soybean yields. - P.J.B. [O.W.]

647. UNITED STATES, SOYBEAN DIGEST. Weeds - still your worst enemy. Soybean Dig., 1960, 20,(6),6-7, figs.1.
Three basic steps for the cultural control of weeds in soybeans are recommended: (1) seedbed preparation using disk and harrow; (2) across-the-row shallow tillage with a spike-tooth harrow, weeder or rotary hoe; (3) between-the-row cultivation with shovel or sweep-type cultivator. - J.W.F. [G.R.I.]

648. UNITED STATES, SOYBEAN DIGEST. Herbicides for use on soybeans. Soybean Dig., 1960, 20, (6),7-10.
The following herbicides are recommended for use on soybeans in the States mentioned: NPA pre-em. 3-6 lb liquid or 20 lb of 20% granules in Illinois, Indiana, Ohio, Iowa (for trial use only), Arkansas, Mississippi, Kentucky and South Carolina; CDAA pre-em. 4-6 lb liquid or 20 lb of 20% granules in Illinois, Indiana, Iowa (for trial use only), Missouri, Minnesota, Nebraska, North Dakota, Wisconsin, Arkansas, Kentucky and Maryland; dinoseb (amine) pre-em. 4-10 lb or post-em. (up to first true leaf stage) 2.25-3 lb in Ohio, Iowa (for trial use only), Wisconsin, and Maryland; amiben pre-em. 3-4 lb in Ohio and Iowa (for trial use only); herbicidal oils 5 gal/ac 2-3 weeks after emergence in Arkansas, Mississippi and Louisiana; PCP (sodium) 3-6 lb at sowing in Missouri; chlorpropham 6-8 lb at sowing or 2 lb + NPA 2 lb at sowing in Ohio. No recommendations are given for Georgia or Arizona. - J.W.F. [G.R.I.]

649. SMARTT, J. A guide to soya bean cultivation in Northern Rhodesia. Rhod.agric.J., 1960, 57,(6),459-63, tabs.6,bibl.3.
Includes a report of a trial in which the effect of 0-5 cultivations on soybean yield was compared on soil in which a varied weed flora occurred, including Rottboellia exaltata and Nicandra physaloides. The results showed that 1 cultivation (in mid-January following an early December sowing) practically doubled the yield, whereas further cultivation increased the yield only very slightly (over that from 1 cultivation).
R. exaltata is easy to control and, if the seed is not allowed to set, will not persist; the seeds do not remain dormant. - D.M.L.S. [O.RE.]

650. ZOGG, H. (Landw.Versuchsanstalt,Zurich, Germany). Unkrautbekämpfung im Drescherbsenbau. [Weed control in field peas.] Landw.Versuchsanstalt Zurich, Pamphlet U/3, pp.2, 1960. [35(494)]

651. SEXSMITH, J.J. Herbicides, wild oats and sugar beets. Silver Sunshine, 1960, 19, 22-3.
In a trial in 1959, EPTC 3 lb and Avadex (2,3-dichloroallyl diisopropylthiolcarbamate) 2 and 4 lb pre-em. gave excellent control of wild oats [Avena fatua] and increased beet yields (compared with the weeded controls);

the EPTC reduced the unweeded beet stand by 23-27%. - D.M.L.S. [247(71)]

652. NELSON, R.T., WOOD, R.R. and OLDEMEYER, R.K. (Gt Western Sugar Co., Longmont, Colorado, U.S.A.) Selection of sugar beets for tolerance to endothal herbicide. J.Amer.Soc.Sugar Beet Technol., 1960, 11, (12), 155-9.

Selection of plants showing tolerance to endothal was made within a monogerm sugar beet variety. Selection A was made on the basis of normal development of the primary root on seedlings growing in coarse sand that had been treated with endothal at a rate of 10 #. Selection B consisted of beets that grew in sand which had been treated with endothal at a rate of 140 #. Results of progeny tests indicated that tolerance to endothal was improved by selection and that Selection B was more tolerant than Selection A. - Plant Sci., 36, (6), 18623.

653. SCHUMANN, H. (Inst. für Acker- und Pflanzenb., Meissen, E.Germany). Zu Fragen der Unkrautbekämpfung in Landwirtschaftlichen Produktions-genossenschaften der "Lommatzscher Pflege". [On the question of weed control in the agricultural cooperatives of the "Lommatzsch Cultivations".] Wissenschaftl.Zeitschr.der Hochschule für LPG Meissen, 1958, 1, (1), 93-108, (G.), figs.17, tabs.5, bibl.23.

Experiments on potatoes are described, using INOC 1.5 kg/ha; on beet using a growth-regulator herbicide (name and rates not given) and on maize using MCPA and 2,4-D at 1.0-1.5 kg/ha. The results emphasised that to obtain optimum control from herbicides, the soil must be well worked and friable. - P.C.

654. OVERTON, J.R., LUCK, H.W. and ANDREWS, H. Cotton defoliation. Tenn.Fm Home Sci., Progr.Rep., 1960, (34), 4-5, tabs.1.

In trials at the West Tennessee Experiment Station during 1957-9, cotton was treated early (one-third of bolls open) or late (two-thirds of bolls open) with calcium cyanamide, sodium chlorate + sodium pentaborate, S,S,S-tributyl phosphorotrithioate, sodium chlorate, sodium chlorate + borate, magnesium chlorate and amitrole. The results indicated that 80-90% leaf drop could be expected with most defoliants applied when one-third of the bolls were open. There were no significant differences in total lint cotton yields between treatments. There was some regrowth with all treatments. - P.J.B. [15(76.8)]

655. MOSLAND, A. (Deitefors/Ksgarden Apelsvoll, Norway). Deitekontroll på Frostvoll i Brekken. [Pasture control at Frostvoll in Brekken.] Forskn.Fors. Landbr., 1960, 11, (2), 187-202, (Nor.e.), bibl.5.

A pasture of 2.48 ha, situated 62° 35'N at 2500 ft altitude, consisting principally of Agrostis tenuis and Nardus stricta, was divided into 4 fields and given: (a) 250 kg superphosphate, 130 kg 33% K fertilizer and 350 kg nitrate of lime/ha/year between 1942-8 and 1950-7 (1 field); (b) as (a) except that 40% more fertilizer/year was applied during 1950-7 (2 fields); (c) as (a) except for 80% more fertilizer/year applied during 1950-7 (1 field). Cows grazing this pasture during 1942-8 yielded 130 kg more milk and 0.2 kg more live weight/animal/year than on unmanured pasture. Adjusting for the increase in the productivity of (a), treatment (b) increased yields by 150 Scandinavian feed units/ha and (c) by 380 feed units/ha. As a result of manuring and grazing, the botanical composition of the sward had changed, by 1948, to 40% Agrostis tenuis, 25% Deschampsia caespitosa and 20% Festuca ovina/F. rubra, and by autumn 1958 had become 10% A. tenuis, 20% D. caespitosa, 10% Trifolium repens, 20% Phleum alpinum/Festuca spp./Poa spp. and 20% Alchemilla spp. - From Herb.Abstr., 31, 72. - J.W.F.

656. SMITH, C.S. Without the plough. Fmrs' Wkly, 1960, 53, (25), 74.

A poor pasture on thin, oolitic limestone soil in Gloucestershire with a cover of thistles, nettles, Ranunculus bulbosus, Nardus stricta, cocksfoot and white clover was sprayed on 30th May, 1960, with 7 # of a formulation containing 85% dalapon sodium and 1.5 # of a 50% 2,4-D formulation. Sward kill was virtually complete and a herbage mixture + rape was drilled into the dead sward 4 weeks after spraying and the area further treated with one pass of a pitch-pole harrow. By late August, cover was virtually complete and 80% of it consisted of sown species. No adverse effects of dalapon residues were noted. - P.J.B. [O.W.]

657. VINCETT, M.T. (Univ.Wisconsin, Madison,U.S.A.) Dalapon as an aid to tillage in preparing seedbeds on unploughable slopes. Ph.D.Thesis, Univ.Wisconsin, 1960, pp.89, Microfilm $2.50, Xerox $4.60.
Three field experiments and a glasshouse study were conducted to investigate the effectiveness of various combinations of dalapon and tillage in preparing a sod for sowing improved forage species. Dalapon at 5 and 10 # a.e. were equally effective in controlling bluegrass [Poa pratensis]. Autumn or spring applications, accompanied by spring tillage, gave adequate control of bluegrass. Autumn tillage of areas treated with dalapon in the autumn did not improve the control of bluegrass, but appeared to reduce the amount of tillage required during the following spring. Autumn applications of dalapon required to be accompanied by tillage to provide effective control of quackgrass [Agropyron repens]. Spring application with moderate tillage gave satisfactory control. Two applications of 5 # did not give better control than one application of 10 #. Autumn applications of dalapon were as effective as heavy autumn tillage in facilitating the physical preparation of the seedbed the following spring. No deleterious effects on the forage species sown on the dalapon treated plots were observed. - From Diss.Abstr., 21,(6). - J.W.F.

658. CAMPBELL, M.H. (Exp.Farm,Bathhurst, New South Wales,Australia). The establishment and foliage production of Trifolium subterraneum when oversown on an unploughed seedbed immediately after chemical treatment. Proc. 2nd Aust.Weeds Conf., 1960, Pap.29, pp.7 figs.2,tabs.1,bibl.1.
When oversown on an unploughed seedbed immediately after spraying, establishment and growth of subterranean clover under high moisture conditions was seriously hindered by dalapon 20 # and by TCA 30 and 80 # but was successful on the dalapon 10 # plots. - D.M.L.S. [O.W.]

659. CAMPBELL, M.H. (Exp.Farm,Bathhurst, New South Wales,Australia). The effect of applying low rates of herbicides to a subterranean clover (Trifolium subterraneum L.) - serrated tussock (Nassella trichotoma (Nees) Hack) association. Proc.2nd Aust. Weeds Conf., 1960, Pap.28, pp.6, figs.1, tabs.2,bibl.1.
Dalapon ca. 1-6 # and TCA ca. 5.5-11 # were applied in autumn to a non-arable tussock-infested area which had been oversown with subterranean clover 2 years earlier. The clover was in the seedling stage when sprayed. The 2 herbicides caused similar injury to the clover and both checked its growth and reduced its foliage production; regeneration the following year was, however, normal. Though tussock growth was checked, it was not killed by the herbicides, whereas in the control plots where clover growth was not inhibited by the herbicides tussock growth was much more seriously impaired. It is concluded that in order to remove tussock from a tussock and clover association, herbicides must be applied when the clover is dormant or sufficiently mature to be resistant. - D.M.L.S. [O.W.]

660. VOISIN, A. (Ecole Nat.Vet.,Paris, France). Better grassland sward. Crosby Lockwood & Son, 1960, pp.341, bibl.286.
The effect or influence on grassland flora of cutting, grazing methods, seeds mixtures, animal treading and excreta, light, soil moisture and acidity, organic and inorganic fertilizers, trace elements, drainage, harrowing and rolling are among the subjects reviewed. Some results of trials are given. Chemical control of grassland weeds is only very briefly mentioned.
Purple melick grass [Melica sp.] is killed if cut early close to the ground, but not if cut late. The best time to cut thistles [Carduus spp.] is at the onset of flowering. Drainage followed by 2 rollings will eradicate Equisetum palustre, provided the first rolling is not done before development of coarse stalks. The second rolling should be done following regrowth. - D.M.L.S. [O.R.]

661. TREW, E.M. and LONG, J.A. Weed control in cultivated pastures and meadows. Leafl.Texas agric.Ext.Serv., (n.d.), L-476, pp.8.
See Weed Abstr., 9,241. [132(76.4)]

662. MONROE, W.E. and SMILIE, J.L. Control pasture weeds. Agric.Ext.Publ. Louisiana State Univ.agric.Ext.Serv., (n.d.), 1266, pp.10, tabs.1.
Gives practical recommendations for the use of 2,4-D. - P.J.B. [31(76.3)]

663. RICHTER, W. (Inst.Grünlandschädlinge der Biol.Anst.,Oldenburg,Germany). Verunkrautungen im Grünland nach Schädlingsbefall. [Weed infestations in grassland after pest infestation.] Grünland, 1959, 8,(10),63-4.

The depredations of animal pests - notably mice and leatherjackets - were shown to exercise a marked influence on the quality of pastures. By eating and burrowing, bare patches were caused, which filled up with weeds, particularly such weeds as Ranunculus spp., Equisetum spp. and Cirsium spp. with the capacity to use N more rapidly than the pasture grasses. - P.C. [260(43)]

664. MAJOR, J., McKILL, C.M. and BERRY, L.J. Improvement of medusahead-infested rangeland. Leafl.California agric.Exp.Sta., Ext.Serv., 1960, pp.8, figs.6.

The characteristics, distribution in California, ecology and biology of Elymus caputmedusae are reviewed. Recommendations are given for control by burning and by the use of herbicides, including dinoseb and dalapon (4 %). EPTC (4 % incorporated) and simazine (2-4 %) also show promise as pre-em. (weed) treatments in autumn. Spot infestations can be controlled by applying borate + chlorate mixtures (1-2 lb/100 ft2). Where conditions are suitable, combinations of cultivation, reseeding, fertilization and grazing management are recommended and practical details are given. - P.J.E. [211(79.4)]

HORTICULTURAL, ORNAMENTAL AND PLANTATION CROPS

See also 741.

665. VIDME, T. and JAKOBSONS, P. Forsøk med kjemiske midler mot ugras i gulrot 1951-55. [Trials on chemical weed control in carrots, 1951-55.] Forskn.Fors.Landbr., 1960, 11,(4),351-65, (Nor.e.).

The results are reported of 30 trials at different locations in Norway. In the first trial series plots were treated post-em. either once at the 3-true-leaf stage of the carrots, or twice, at the 3-true-leaf stage and again at up to 4-5 weeks before harvest, with the following at 75 l/decare: diesel oil, Shell Herbicidal oil, Esso Weedkiller and white spirit. Controls were hand-weeded. Compared with controls, white spirit resulted in the highest increase in yield of marketable carrots (+ 306 kg/decare on plots sprayed once, and + 235 kg on plots sprayed twice). Spraying twice with diesel oil and Shell Herbicidal oil tended to increase the incidence of non-marketable roots and late applications of diesel oil caused taint. Hand-weeding time was reduced by 52 hours/decare after spraying once and by 2 hours after the second spraying. In a second trial series, the following treatments were applied: (a) hand-weeded only, (b) sulphuric acid (5% w/w) pre-em. and Shell Herbicidal oil post-em. when the carrots were pencil-thick, (c) Shell Herbicidal oil post-em. at the 1- to 2-true-leaf stage, (d) Shell Herbicidal oil as in (c) and again 4-5 weeks before estimated harvest date, (e) white spirit post-em. at the 1- to 2-true-leaf stage. All herbicides were applied at 75 l/decare. All sprayed plots significantly outyielded hand-weeded plots, but did not differ significantly between themselves in yield. Treatment (e) resulted in highest yields (501 kg/decare more than controls) of marketable carrots, followed by (c), with 434 kg more than controls. Treatment (b) significantly increased the proportion of non-marketable tubers. Weeding time for treatments (a), (b), (c) and (e) averaged 75, 52, 31 and 33 hours respectively. In a third trial series the following treatments were imposed (the oil in each case was white spirit): (a) hand-weeded, (b) sulphuric acid pre-em., oil post-em. at the 1- to 2-true-leaf stage, (c) oil pre-em. and post-em. at the 1- to 2-true leaf stage, (d) oil post-em. at the 1- to 2-true-leaf stage, (e) oil post-em. at the 1- to 2-true-leaf stage and again at pencil thickness. All treatments resulted in large and significant yield increases over hand-weeded controls, but there were no significant differences in yield between treatments. Treatment (c) resulted in the highest yield increases of marketable carrots (+ 518 kg), followed by (d) and (e) (+ 444 and + 437 kg/decare). Treatment (c) resulted in the greatest increase in non-marketable roots. Control of all weeds except Senecio vulgaris and Agropyron repens was good. - P.J.E. [55(481)]

666. HAIL, B.J. (Hawkesbury Agric.Coll., New South Wales,Australia). Chemical weed control in vegetables. Commercial application of new techniques. Agric.Gaz.N.S.W., 1960, 71,(11),601-5, figs.6.

Includes the information that the practice

of one commercial firm in asparagus is to apply monuron 3 # after a late winter cultivation. - D.M.L.S. [O.W.]

667. PEABODY, D.V. Jnr. (Northwestern Exp.Sta., Mount Vernon, Washington, U.S.A.) Chemical weed control in ornamental bulbs (iris, narcissus and tulips). Daffodil & Tulip Yearb., 1960, 1-4, figs.1, bibl.6.
Conventional methods will control perennial weeds in bulbs, but many annuals require selective herbicides for eradication. A variety of substances have been tried, including MCOC, dinoseb and diesel oil, alone or in combination, but their disadvantages outweighed their advantages. Long-term trials with diuron and simazine have, however, been shown to provide adequate weed control with safety. - P.C. [59(75.3)]

668. SUMITOMO, A. and KOSUGI, K. [The effect of herbicides on gladiolus corm and cormel production with special reference to the time and number of applications and to the combination of chemicals.] Tech.Bull.Fac.Agric.Kagawa Univ., 1959, 11, (sp.issue), 177-80, (Jap.e.).
The best results in both weed control and corm and cormel production were obtained by 10 applications of (1) 2,4-D 100 g, (2) 2,4-DES 200 g + 2,4-D 70 g and (3) 2,4-DES 200 g, in that order. Weed control increased in effectiveness with the number of applications and was better with early application than with late.
Propham 100-300 g/10 applications [sic] was either injurious or ineffective. 2,4-DES 400 g/10 applications [sic] and 2,4-D 200 g were safe for corm and cormel production. - From Plant Sci., 35, (23), 68308 (modified). - D.M.L.S.

669. AUSTRALIA, AGRICULTURAL GAZETTE, NEW SOUTH WALES. Control of nut grass, onion weed and Oxalis. Agric.Gaz., N.S.W., 1961, 72, (1), 19-20.
Recommendations are given for the use of amitrole for controlling Cyperus rotundus, Nothoscordum inodorum and Oxalis sp. in gardens. - P.J.B. [O.W.]

670. DANIEL, W.H. and LEE, O.C. (Agron. Dep., Purdue Univ., Lafayette, Indiana, U.S.A.) Controlling crabgrass. Preventing and killing. Midwest Turf News & Res., 1961, (11), pp.4.
Management procedures designed to prevent the growth of crabgrasses [Digitaria spp.] in turf are reviewed briefly and commercial formulations of pre- and post-em. herbicides listed, with notes on each herbicide. - P.J.B. [50(77.2)]

671. ROBERTS, E.C. and PELLETT, H.M. (Dep. Hort., Iowa State Univ., Ames, U.S.A.) Yes, you can control crabgrass. Iowa Fm Sci., 1961, 15, (10), 681-683, figs.4, tabs.1.
The problem of crabgrass (Digitaria ischaemum, D. sanguinalis and Eleusine indica) in lawns is described, cultural control methods discussed and recent tests with herbicides outlined. For control of established seedlings, phenyl mercuric acetate, disodium methyl arsonate or amine or ammonium methyl arsonate are recommended, applied according to manufacturers' directions. In prevention of germination and establishment, Zytron (O-(2,4-dichlorophenyl)-O-methylisopropylphosphoramidothioate) and Dacthal (dimethyl-2,3,5,6-tetrachloroterephthalate) gave better and more consistent results than Chlordane (1,2,4,5,6,7,8,8-octachloro-4,7-methano-3a,4,7,7a-tetrahydroindane), lead arsenate, arsenious oxide and tricalcium arsenate. - H.A. Roberts. [N.V.R.S.]

672. TREW, E.M. and LONG, J.A. Chemical weed control in lawns. Leafl.Texas agric.Ext. Serv., (n.d.), L-425, pp.10.
Recommendations are given for the control of a range of specified grass and broad-leaved weeds in lawns, using endothal, disodium methylarsonate, amine methylarsonate, naphtha, ammonium nitrate, 2,4-D and 2,4,5-TP. - P.J.B. [131(76.4)]

673. SOUTHWICK, L. (Dow Chem.Co., Agric.Chem. Development, Midland, Michigan, U.S.A.) Dow crabgrass killer. Down to Earth, 1961, 16, (4), 3-5, figs.1, tabs.4.
Zytron (O-(2,4-dichlorophenyl)-O-methylisopropylphosphoramidothioate) is reported to have consistently given 85-100% control of crabgrass (Digitaria spp.) in tests in many areas of the U.S.A. where this weed is a problem in turf. In tests with different carriers for Zytron used pre-em., vermiculite, perlite and ground corn cob did not influence its effectiveness; the latter was chosen as the carrier for commercial use. In trials during 3 years with rates of Zytron 10, 15 and 20 #, results indicated that with uniform application, 15 # is sufficient to give good crabgrass control. Granular Zytron pre-em. is reported to have given good control of Polygonum aviculare in

a number of trials; control of such turf weeds as Poa annua has been variable. Zytron is reported to have caused growth stimulation in Poa pratensis turf, though the reason for this is not known. Injury caused by this herbicide has been commonest in narrow-leaved Festuca spp. and certain Agrostis spp., but recovery is usual. - P.J.B. [O.W.]

674. GAST, A. Simazin als allgemeines und selektives Herbizid. [Simazine as a general and selective herbicide.] Proc.4th internat.Congr.Crop Protect.1957, 1959, 543-7, (G.)
Data are given comparing the rapidity with which simazine and monuron are leached in the soil. In 3 trials in which simazine and monuron, each at 2, 5 or 10 kg/ha were applied to garden paths carrying weed populations of Lolium sp., Poa sp., Taraxacum sp. and Plantago media, simazine at 2 kg maintained substantially weed-free conditions for 9 months and 5 kg for more than 20 months. Monuron at 5 kg was less effective than simazine and maintained substantially weed-free conditions for 9, but not 13 months. In trials in 1955 with red currants in which simazine at 0.5, 1, 2.5 and 5 kg/ha and monuron at 1, 2.5 and 5 kg/ha were applied on 20th April to weedy soil, all rates of simazine maintained almost weed-free conditions for 3 months, with no injury to the crop. Monuron, even at 5 kg/ha, was considerably less effective against the weeds and all rates caused some crop injury. Predominant weeds present included Sonchus arvensis, Ranunculus repens, Polygonum aviculare, Chenopodium album, Capsella bursa-pastoris, Convolvulus sepium, Plantago lanceolata and grass weeds. The first 3 species mentioned, together with Agropyron repens, survived simazine treatment. Data are given of the persistence of simazine in 4 soil types. - P.J.B. [O.W.]

675. PEABODY, D.V.Jur., CRANDALL, P.C. and ROCHE, B. Weed control in strawberries for western Washington. Ext.Misc.Publ. Wash.State Univ., 1960, (rev.), 11, pp.1.
Simazine for early and late application, 2,4-DES for routine treatment. - Hort.Abstr., 31,(1),383.

676. THOMPSON, B.D. Response of strawberries to mulching with plastic. Proc. Fla State hort.Soc., 1959, 1960, 72,179-85, bibl.13.
An opaque plastic mulch suppressed weeds, conserved soil moisture, increased soil temperatures in cool weather and reduced them in warm weather and increased yields. With the advent of hot weather, however, plants grown with plastic mulch tended to decline more rapidly than non-mulched plants. Weekly applications of captan, combined with plastic mulch, appeared to act synergistically as measured by increased yields. - Hort.Abstr., 31,378.

677. STRYCKERS, J. Stellaria media (L.) Vill., muur in laagstamboomgaarden, met onderteelt van aardbeien. [Chickweed in low-worked orchards intercropped with strawberries.] Belg.Fruit Rev., 1959 11,3-4.
The only safe and effective herbicides to use under these conditions are propham at 6 kg/ha or better still chlorpropham at 2-3 kg/ha, applied in October or November. - Hort.Abstr., 30,5254.

678. ARCHIBALD, J.A. Orchard soil management. Publ.Ontario Dep.Agric., 1960, (rev.), 457, pp.43.
Includes discussion of weed control. - From Hort.Abstr., 31,267. - D.M.L.S.

679. HUGLIN, P. (Station de Recherches Viticoles,Colmar,France). Les desherbants chimiques en viticulture. [Chemical weed killers in viticulture.] Phytoma, 1960, pp.5, (F.), figs.8.
A brief review of French and/or Swiss experience with dalapon, monuron, diuron, simazine, amitrole and DNOC. Dalapon has been used in several areas at rates up to 10 kg/ha without injuring the vines but in the Languedoc it caused serious injury to root stocks. Monuron has caused injury on light soils, even at low rates, and is injurious when in direct contact with the vines. In a wet year 5 kg/ha caused marginal chlorosis whatever the soil, the rootstock or the age of the vine. But in other trials rates up to 40 kg/ha on heavy soils have not caused injury. Diuron is more toxic to vines than monuron and on light soils rates should not exceed 3 kg/ha (10 kg/ha applied in July on a sandy soil caused a 10% yield reduction the following year). No injury has so far been reported from simazine at rates up to 40 kg/ha. Satisfactory results have been given by amitrole 10 kg/ha + simazine 3 kg/ha and from DNOC 5 kg/ha + diuron 3 kg/ha. Amitrole alone has had a too short-lived effect. - D.M.L.S. [117(44)]

680. KRETCHMAN, D.W. (Citrus Exp.Sta., Lake Alfred, Florida, U.S.A.) Dalapon for controlling perennial grasses in Florida citrus groves. Down to Earth, 1961, 16, (4), 6-9, figs.7, tabs.1, bibl.3.

In preliminary studies, dalapon at high rates of 5-15 % applied to citrus tree roots or where it has been leached before absorption by grasses, has injured the trees, often severely. Satisfactory control of grasses before planting citrus has been given by two applications each of dalapon 3.7-5.6 %, with a 5- to 14-day interval, followed by ploughing 4 weeks later. This has given good control of Cynodon dactylon, Pennisetum purpureum, Panicum maximum, P. purpurascens, P. hemitomon, Digitaria decumbens and Paspalum notatum. Re-treatment is usually necessary. Where grasses are still present after citrus planting, two between-row sprayings each with dalapon 3.7 % with 5- to 10-day intervals has given good control until the trees are about 2 years old, or the roots grow into the middles between the rows. In field trials in 1959, dalapon at low rates (1.5 or 3 %) + diuron 6.4 %, with dalapon doses repeated up to 3 times, gave variable, but usually satisfactory grass control with little injury to the citrus. For Cynodon dactylon, 3 applications of dalapon 1.5 % with 2- to 4-day intervals were very effective, when made soon after growth resumption in spring. This treatment also gave good control of Panicum hemitomon and (for 3 months only) of Panicum maximum. With Panicum purpurascens this treatment was only moderately effective and still less effective against Panicum repens. - P.J.B. [O.W.]

681. McCARTY, C.D., DAY, B.E. and RUSSELL, R.C. (Univ.California, Riverside, U.S.A.) Effect of monuron on lemon fruit quality. Calif.Citrogr., 1960, 45, 174.

Plots of Eureka lemons were treated twice yearly with either 2 lb monuron/ac or weed oil, or were cultivated to control weeds. Tests after the application of a total of 17 lb monuron showed only very slight differences in fruit shape due to treatments and none in either rind thickness or juice content. Juice composition was not significantly changed. - Hort.Abstr., 30, 5303.

682. VENEZUELA, SHELL AGRICOLTURA. Herbicidas en citricas. [Herbicides in citrus.] Not.agric.Serv.Shell Agric., Cagua, 1959, 2, 35-6.

To maintain a circular area free from weeds under the crown of each tree, it is enough in Venezuela to cut the weeds, moisten the soil, and apply monuron twice a year, using 0.5-2 l of the solution (1 kg of the commercial product/200 l of water) under each tree, avoiding the foliage. - From Hort.Abstr., 30, 5302. - D.M.L.S.

683. SURINAM, LANDBOUWPROEFSTATION. Jaarverslag, 1959, pp.116.

Work in progress includes weed control in citrus. - From Hort.Abstr., 31, 1659. - D.M.L.S.

684. REHBEIN, C.A. and BATES, G. (P.O. Box 122, Gordonvale, Meringa, Queensland, Australia). A review of chemical weed control in North Queensland canefields. Cane Grs' quart.Bull., 1960, 24, 27-9.

The use of 2,4-D in sugar cane plantations and problems of application to tall-growing crops are discussed. In 1959, 1300 ac were treated from the air in the Cairns area and 40 ac in Mossman, while the estimated acreage to be sprayed from the air in 1960 was 3000. A small inter-row tractor equipped with a sprayer is suggested as being the ideal arrangement for weed control in cane and a description of one of these tractors, which is producing excellent results, is given. - J.W.F. [C.A.]

685. ROCHECOUSTE, E. (Mauritius Sugar Indust. Res.Inst., 514 Reduit, Mauritius). Evaluating herbicides in sugar-cane cultivation. Proc. 10th Congr.Internat.Soc.Sugar Cane Technol., 1959, 549-55, tabs.1, bibl.5.

Methods of assessing herbicides used for weed control in sugar cane in Mauritius during the 5 year period up to 1959 are reviewed. Optimum plot size and shape is considered to be one-fortieth of an ac, with 4 cane rows and for ratoon crops one-twentieth of an ac, with 8 rows. Layout should be a randomized block, with 4 replications. Descriptions are given of the separation and weighing methods, the % area method and the frequency-abundance methods of assessing weeds.

For assessing weed mortality, a points system and a system for working out a mortality-abundance rating are given, together with a 10-point visual scale for assessing cane injury. - P.J.B. [22(698.2)]

686. WEST INDIES, CENTRAL AGRICULTURAL RESEARCH STATION. Rep.Cent.agric.Res.Sta., Trinidad, W.Indies, 1959-60, pp.180.

pp.5-6, 59-86. Weed control. Details are given of several trials in plant sugar cane and ratoons, in which the herbicides used were:- 2,4-D (various formulations), FS-40 (fortified

oil containing PCP and 2,4-D), simazine, diuron + 2,4-D, atrazine, Shell WL 3379, EPTC, dalapon + 2,4-D, barban, CDAA + trichlorobenzyl chloride (Randox T), monuron and Hercules 7442 (?). Pre-em. weed control with diuron 3.2-6.4 lb, simazine 4 lb or mixtures of 2,4-D with diuron, simazine or atrazine was far superior to that obtained with standard 2,4-D treatments or with hand weeding. EPTC 3-5 lb incorporated or 6-10 lb not incorporated, atrazine alone at 1.5-2.5 lb and Shell WL 3379 were unsatisfactory, and monuron was inferior to diuron when applied at low rates. In pre-em. trials in ratoons, diuron was better than simazine or atrazine, but good results were only obtained when application was made after the onset of the rains. The following are resistant to diuron: Cyperus rotundus, Xanthosoma helliborifolium, Caladium bicolor and Phyllanthus sp.

In post-em. trials, excellent weed control was obtained with diuron 3.2 lb alone or at 2.4 lb + 2,4-D ca. 1 lb; the results were better with a volume of 30 gal/ac than with 20 gal/ac and indicated that application is best when weeds are 8-12 in. high. Dalapon 3.4 lb + 2,4-D (ester) ca. 1 lb was far inferior and Hercules 7442 2-6 lb barban 0.75 and 1.5 lb and Randox T 4 and 5 quarts/ac were useless. The two diuron treatments gave an excellent kill of Panicum fasciculatum whereas 2,4-D (amine) ca. 1 lb alone was ineffective. A complete kill of all weed species was obtained in 5 days with ICI PP 910 [1,1-dimethyl-4,4-bipyridylium di(methyl sulphate)] 0.5 gal/ac in 40 gal water. Various ester and amine formulations of 2,4-D at rates of ca. 0.5-3 lb were ineffective in controlling weeds. Injury caused by diuron in pre-em. trials occurred only in areas deficient in phosphate. Band treatments were unsatisfactory. Costs are discussed. - D.M.L.S.

687. ROTH, H.E. (J.R.Geigy, S.A., Basle, Switzerland). Up-to-date weed control in sugar cane. Internat.Sug.J., 1960, 62, (740), 207-9, figs.2.

In pot studies in Hawaii, sugar cane is reported to have tolerated concentrations of up to 10 p.p.m. (equivalent to 14 lb) simazine in the soil (to a 6 in. depth) and 20 p.p.m. resulted in only slight stunting. Simazine at 4 and 8 lb applied (a) to germinating setts before closing the furrow, (b) pre-em. over the closed furrow and (c) to young, emerged canes is reported to have caused no crop injury. Control of Erechtites hieracifolia has been good. The best time to apply simazine to new canes has been after rain or irrigation, within 8-10 days after planting and with ratoon canes, immediately after harvest and cleaning up. - P.J.B. [38(494)]

688. ROBINSON, E.L. and STOKES, I.E. (U.S.Dep.Agric., Crops Res.Div., Agric.Res. Serv., Whiteville, N.Carolina, U.S.A.) Witchweed: a potential pest of sugar cane in the United States. Sugar J., 1960, pp.3, tabs.2, bibl.5.

Forty varieties of sugar cane were tested in 1958 for resistance to Striga asiatica. Coimbatore 290 was the most resistant. Other resistant varieties were Coimbatore 281, Canal Point 33-224, 50-28 and 53-19 and Florida 31-762. In trials in 1959 with 19 varieties which had shown resistance to S. asiatica in 1958, fumigation with methyl bromide increased cane yields by 40-200%. - P.J.B. [46(75.6)]

689. HOCOMBE, S.D. (Colonial Pesticides Res.Unit., Arusha, Tanganyika). Notes on a conference on the control of couch and other grasses in East African plantation crops, particularly with the use of dalapon. Pest.Abstr.News Summary, Sect. C, 1960, 6, (4), 109-16.

In an introductory paper, Dr. Ripper of Dow Agrochemicals, England, said, inter alia, that when using dalapon, the addition of acid to water from alkaline areas to adjust the pH to about 5 would probably by beneficial. Cultivation or slashing could be done 3 weeks after spraying couch (Digitaria scalarum) with dalapon; 6 weeks was an unnecessarily long interval.

Coffee. For couch control in coffee, J.A.N. Wallis of Kenya recommended dalapon (commercial formulation) 7 lb after slashing when coffee is 4-6 in. high, applied in 70 gal water for knapsack sprayers and in at least 40 gal/ac for boom sprayers, followed by treatment at 5 lb of regrowth 4-6 in. high.

D.G. Thomas of Uganda recommended cultivation rather than slashing prior to spraying and a dosage of 5 lb in 60-100 gal water. Slashing 6 weeks after spraying was preferred to cultivation 3 weeks after. Both authors recommended spraying during a rainy period with, preferably, a dry interval of at least 2 hours after spraying.

Tea. N.L. Howarth of Kenya said that a programme involving spraying with dalapon (commercial formulation) 10 lb in 100 gal water when couch is 3-6 in. high with

several subsequent spot sprayings had caused less damage to tea than "deep forking" of couch and was much less costly. Spraying is done after pruning, and it is necessary first to disentangle the couch from the tea bushes without uprooting the couch, and to remove most of the prunings.

Sugar cane. K.V. Isaac had found in Uganda that dalapon 8.5 # applied 6 weeks pre-planting gave good couch control without affecting the crop; 12.75 # either in one or in split doses with a 3-week interval was injurious. 8.5 # applied pre-em. when couch was 2-3 in. high did not injure Co and NCo varieties but caused some leaf yellowing on POJ, M and B varieties; 8.5 # was successful when applied to 1.5-2 month old ratoon cane.

L.B. Bjorking from Northern Tanganyika had found dalapon costly and also that rates which gave good couch control (7-10#) had to be kept off the cane. However, if it were cheaper he would advise its use for band treatment after hilling-up of irrigated cane and also for firebreaks and the banks of irrigation furrows.

Sisal. Mr. Lerche of the High Level Research Station in Kenya had obtained good couch control with dalapon 10 # applied to a dry and recently cultivated soil before couch emergence, provided the rhizomes had not become aggregated by previous tining. Pre-planting application was advised because spraying of bulbils caused severe deformities and leaf yellowing and on older plants dieback of the tips of the lower leaves. Dalapon 10 and 20 # in 100 gal water had given excellent control of annual grasses with the result that 2 years later the treated sisal appeared to be a year more advanced in growth than the untreated.

Pyrethrum. V. Kroll of the Pyrethrum Station, Molo, Kenya, said that dalapon was injurious to established pyrethrum, but could be used pre-planting at 5-10 # for control of D. scalarum and Pennisetum clandestinum in conjunction with preliminary cultivation. Pyrethrum had been safely planted 3 weeks after dalapon treatment.

Lucerne. D.M. Rocco reported that in a trial for the control of Cynodon dactylon and P. clandestinum in lucerne in which 6 bi-monthly spot sprayings with dalapon 5 # in 45 gal water had been compared with hoeing for 14 days/month, both treatments had given slight yield increases, but, owing to its high price, any economic advantage of dalapon would be small.

P. clandestinum. R.J. Yates and P.R. Attwood described an uncompleted trial for the eradication of P. clandestinum from a pasture about to be broken up for arable cropping. Dalapon 10 # in 40 gal water was applied in March and/or in November with cultivation following 3 weeks after the November spraying date. All dalapon treatments reduced P. clandestinum to less than 25% of that on plots cultivated only. The March spraying when grass was growing well appeared slightly more effective than the other treatments.

J. Morrison suggested that in high-altitude grassland, dalapon might be better than hand removal for the control of Eleusine jaegeri and dalapon preceded by burning for P. schimperi control.

Wattle. Wattle had been found to be susceptible to dalapon, but it was suggested that it could be used immediately before stripping or after burning. Couch-infested wattle did not respond to fertilizers.

Pineapples. Dalapon 5 # had severely damaged first-year plants, but it was safe on ratoons provided the spray did not touch the leaves.

Other points which emerged during the conference were that Themeda trianda, a desirable pasture species, is highly resistant to dalapon, and that Imperata cylindrica had been undamaged by 20 #. - D.M.L.S. [O.W.]

690. FLEMING, S.D. (Tech. Dep., Fisons Pest Control (E.A.) Ltd.) Couch - the old enemy of clean plantation crops. Tea, 1960, 1,(1), 33-4, (2), 17-18.

Of various chemicals tested for couch [Digitaria scalarum] control in tea plantations in Kenya, dalapon has been most successful. The best time to apply it in mature tea is before bud break or after completion of bud break following pruning. In young stump trees, low dosage rates, repeated applications and the use of a hooded spray lance are advised. Mature China Hybrid has not been injured by overall applications of 15 #, but Assam type bushes are more sensitive. In a large-scale experiment 10 # applied immediately after pruning and before bud break caused injury to only 1% of the bushes and when applied after completion of bud break, injury averaged only 0.4%. Injury was associated with (1) weak "pingi" bushes and (2) application during bud break after pruning. - D.M.L.S. [M.H.]

691. BRAUER, H.O. Destruccion de malas hierbas en los plantios de cafe. [Weed control in coffee plantations.] Proc. Carib. Reg. Amer. Soc. hort. Sci. 1957, 1958, 5, 55-7, (Span.), bibl. 3.

The commonest weeds in coffee in Mexico are listed and herbicides for their control indicated. In limited Mexican trials, no damage has been caused to coffee by (1) 2,4-Dow Formula 40 [2,4-D (alkanolamine) (ethanol and isopropanol series) 65%] 2-6 l/ha; (2) Esteron 10-10 [2,4-D (propylene glycol butyl ether esters) 70.5% (a.e. 43.5%)] 2-8 l/ha; (3) Dowpon [dalapon (sodium) 85%] 3-12 kg/ha. - D.M.L.S. [Md.H.]

692. VENEZUELA, SHELL AGRICOLTURA. Hacia el control quimico de las malezas en cacaotales. [Advances in weed control in cacao plantations.] Not.agric.Serv.Shell Agric.,Cagua, 1958, 35,1-3.
The chief weeds in Venezuelan cacao plantations are Urera spp., Heliconia spp., Piper spp., Petiveria alliacea and Hamelia patens. Good control has been obtained with either 6 l of 40% 2,4-D (amine) or 3 l each of 2,4,5-T and 40% 2,4-D in 400 l water/ha, applied to new weed growth after cutting, and repeating if necessary. Care should be taken to avoid wetting the cacao trees and the banana and plantain shade plants. 2.4-D and related products are injurious to young cacao trees and should not be used in them. Hort.Abstr., 30,5301 (modified). - D.M.L.S.

693. ALDHOUS, J.R. (Forestry Commission Res.Sta.,Alice Holt Lodge,Farnham,Surrey, England). Experiments in hand-weeding of conifer seedbeds in forest nurseries. Weed Res., 1961, 1,(1),59-67, (E.g.f.), tabs.5,bibl.8.
In 5 trials during 3 years at 3 locations, plots sown with conifer seed were hand-weeded at intervals ranging from 1.5-2 weeks following an initial pre-em. treatment with vaporizing oil at 60 gal/ac. Conifer seedlings did not appear to be sensitive to competition from small weeds and in 4 out of 5 trials, frequency of weeding did not significantly affect either the number or height of the conifer seedlings at the end of the season; but in the remaining trial were lowest on plots weeded at 12-week intervals. The total accumulated times required for hand weeding with intervals of 6-8 and 12 weeks were, respectively, 1.5-2 and >5 times as great as with intervals of 3-4 weeks. In 4 out of 5 trials, the total weeding time was least with intervals of 3-4 weeks. The total number of weeds removed rose substantially where the weeding intervals were greater than 4 weeks. It is suggested that 3-4 weeks may also be the optimum interval between applications of contact herbicides or between weedings by mechanical means. - P.J.B. [O.W.]

694. BROWN, J.H. and CARVELL, K.L. (Univ. W.Virginia,Morgantown,U.S.A.) Radapon for effective control of grass around planted seedlings. Down to Earth, 1961, 16,(4), 13-15, figs.4.
In trials in which Radapon (sodium salt formulation of dalapon) at 0.25, 0.15 and 0.07 lb/gal water was applied around the bases of unprotected Scots pine seedlings, good control of grasses was given by the lowest concentration used. Treatments to dormant seedling trees in autumn and spring caused no injury, and treatment in summer caused slight needle browning where the 0.07 lb concentration was used. Higher concentrations caused damage to the seedlings irrespective of time of application. Radapon gave better results than TCA or Varsol and its effect persisted for 3 seasons. The value of Radapon for reducing competition from the grass sward around yellow-poplar on old fields is indicated. - P.J.B. [O.W.]

695. LOERCH, K. Chemical weed control in windbreaks. Nebraska agric.Coll.Ext., 1960, EC 60-1753, pp.4.
Practical hints on using diuron or simazine at 4 lb. - Hort.Abstr., 31,114.

BIOLOGY OF WEEDS AND POISONING BY WEEDS

696. JUSTESEN, S.H. and TAMMES, P.M.L. (Centre for Mathematics in Agriculture, Wageningen,Netherlands). Studies of yield losses. 1. The self-limiting effect of injurious or competitive organisms on crop-yield. Tijdschr.PlZiekt., 1960, 66,281-7, (E.du.), figs.6,bibl.13.
The principle of the self-limiting effect is discussed, using 4 hypothetical models illustrating how competition between pathogens diminishes the effect of individuals as their numbers increase. One model relates yield per plant to number of plants per m^2. - P.J.B. [210(492)]

697. RADEMACHER, B., KOLB, F. and BORNER, H. (Inst. Pflschutz der Landw-Schaftlichen Hochschule Hohenheim, Stuttgart-Hohenheim, W. Germany). Untersuchungen über die gegenseitige Beeinflussung von Kulturpflanzen und Unkräutern in Wasserkultur. [Experiments on the interaction between cultivated plants and weeds in water culture.] Weed Res., 1961, 1, (1), 44-58, (G.e.f.), figs.6, tabs.4, bibl.31.

In experiments with 57 plant combinations, one species each of crops and weeds were grown in alternate pots, interconnected so that nutrient solution perfusing the roots could circulate unidirectionally from one pot to the next so as to expose both crop and weed to the root secretions of the other. Where crops and weeds were of equal ages the root exudates of crops markedly increased the shoot weight of weeds in the following: wheat with Galeopsis tetrahit, potato with Galinsoga parviflora, Mercurialis annua, Senecio vulgaris, Urtica urens and Stellaria media. The shoot weights of weeds were markedly reduced in the following cases: beet with Chenopodium album, rye with Matricaria maritima, and oats with Sinapis arvensis. The shoot weight of oats was considerably increased by Sinapis arvensis and that of potatoes was markedly reduced by Galinsoga parviflora. In trials where either the crop or weed was 14 days older than its partner, potatoes still markedly reduced shoot growth in this crop. In some cases, these effects were attributable to competition for nutrients (this was eliminated in most of the experiments), but was attributable to allelopathic factors in others, e.g. rye with Matricaria maritima, wheat with Matricaria maritima, oats with Papaver rhoeas, oats with Sinapis arvensis, potato with Stellaria media, Urtica urens, Chenopodium album and Polygonum persicaria. The first two instances and that of oats with Sinapis arvensis correspond to findings under field conditions though it was stressed that the results of these experiments could not be assumed to apply to such conditions. - P.J.B. [O.W.]

698. * TAKIJIMA, Y. (Miyagi Agric. Exp. Sta., Japan). Studies on soils of peaty paddy fields. XI I. Effects of soil drainage on the growth of rice plants and on the weed association. J. Sci. Soil Tokyo, 1959, 30, 259-62.

699. LI, Y.H. and HSU, H.C. [A survey of weeds and ecological anatomy study of the typical plant indicators of Kwangpei State Farm Located on saline soil in newly cultivated region.] Acta Agric. Sinica, 1959, 10, (2), 102-20, figs.18.

Eighty-five species belonging to 25 families have been identified and a key made of their botanical characteristics. - From Plant Sci., 36, 8751. - D.M.L.S.

700. McNAUGHTON, I.H. and HARPER, J.L. (Scot. Plant Breed. Sta., Pentlandfield, Midlothian, Scotland). The comparative biology of closely related species living in the same area. 1. External breeding-barriers between Papaver species. New Phytol., 1960, 59, 15-26, figs.5, tabs.2, bibl.32.

External barriers reducing the chances of natural hybridization between Papaver rhoeas P. dubium, P. lecoqii, P. argemone and P. hybridum are studied. - P.J.B. [425(42)]

701. McNAUGHTON, I.H. and HARPER, J.L. (Scot. Plant Breed. Sta., Pentlandfield, Midlothian, Scotland). The comparative biology of closely related species living in the same area. 2. Aberrant morphology and a virus-like syndrome in hybrids between Papaver rhoeas L. and P. dubium L. New Phytol., 1960, 59, 27-41, figs.2, tabs.4, bibl.25. [426(42)]

702. MULLIGAN, G.A. (Plant Res. Inst., Dep. Agric., Ottawa, Canada). Polyploidy in Canadian weeds. Canad. J. Gen. Cyt., 1960, 2, (2), 150-161, tabs.3, bibl.25.

The degree of ploidy for 151 common Canadian weeds is recorded, also the distribution of diploid, polyploid, annual, biennial and perennial weeds in 4 specialised habitats. The differences in the polyploidy incidence % in the various habitats are discussed and suggested explanations given. - D.M.L.S. [242(71)]

703. SEN, D.N. (St. Andrew's Coll., Gorakhpur, India). Systematics and ecology of Indian plants: 1. On the rainy season weeds in Gorakhpur. J. Bombay Nat. Hist. Soc., 1960, 57, (1), 144-72.

A hundred and forty-seven species are recorded. Grasses, trees and shrubs are excluded. - From Plant Sci., 36, 14992. - D.M.L.S.

704. WIEDEMROTH, E.M. (Inst. Systematische Bot. Pflanzengeographie, Halle-Wittenburg, Germany). Die Ackerunkrautgesellschaften im Gebiet von Hainleite und Windleite. [Arable weed associations in the district of Hainleite and Windleite.] Wiss. Z. Univ. Halle, 1960, 333-62, (G.), figs. 12, tabs. 19, bibl. 56.

A floro-sociological study of weed associations in arable land in central Germany was carried out in the neighbourhood of Sondershausen, with particular reference to soil characteristics; and correlations between soil type and plant associations were investigated. Principal associations noted were Caucalis lappula-Scandix pecten veneris with a sub-association with fumitory [Fumaria vaillantii]; Sherardia arvensis-Euphorbia exigua; and Aphanes arvense-Matricaria chamomilla with sub-associations of less importance as indicators of soil characteristics. - P.C. [259(43)]

705. BJÖRKMAN, O., FLORELL, C. and HOLMGREN, P. (Inst. Plant Systematics & Genetics, Roy. Agric. Coll., Uppsala, Sweden). Studies of climatic ecotypes in higher plants. The temperature dependence of apparent photosynthesis in different populations of Solidago virgaurea. K. Lantbr-Högskolans Annaler, 1960, 26, 1-10, figs. 1, tabs. 2, bibl. 11. [O.W.]

706. DARLINGTON, H.T. and STEINBAUER, G.P. (Dep. Bot. & Plant Path., Michigan State Univ., East Lansing, U.S.A.) The eighty-year period for Dr. Beal's seed viability experiment. Amer. J. Bot., 1961, 48, (4), 321-5, tabs. 1.

Seed of 20 species of weeds growing in the vicinity of East Lansing, Michigan, was mixed with moist sand, placed in an open pint bottle and buried at a depth of 18 in. with the mouth of the bottle facing downwards to prevent moisture accumulation. At the end of 80 years, Oenothera biennis, Rumex crispus and Verbascum blattaria were the only species whose seed was still viable; respective percentages of viable seed were 10, 2 and 70. It was concluded that R. crispus seed was almost at the end of its term of viability, while that of V. blattaria was likely to survive for well over a century. Data are also given of the survival of the following: Agrostemma githago, Amaranthus retroflexus, Ambrosia artemisiifolia, Anthemis cotula, Brassica nigra, Bromus secalinus, Capsella bursa-pastoris, Erechtites hieracifolia, Euphorbia maculata, Lepidium virginicum, Malva rotundifolia, Plantago major, Polygonum hydropiper, Portulaca oleracea, Setaria glauca, Stellaria media, Trifolium repens and Verbascum thapsus. The present status of knowledge concerning the behaviour of buried weed seeds is reviewed briefly. - P.J.B. [O.W.]

707. THURSTON, J.M. (Rothamsted Exp. Sta., Harpenden, Herts., England). The effect of depth of burying and frequency of cultivation on survival and germination of seeds of wild oats (Avena fatua L. and Avena ludoviciana Dur.). Weed Res., 1961, 1, (1), 19-31, (E.g.f.), figs. 2, tabs. 3, bibl. 6.

In field trials on heavy clay soil, ripe seed of Avena fatua and A. ludoviciana was sown (3000/plot 137 x 305 cm) at depths of 15 cm or mixed in the top 5 cm of soil and subjected to 5 different tillage regimes for 3 years, followed by hand-digging to a depth of 15 cm in spring and autumn during the next 4 years, with the removal of all plants so as to prevent seed setting. Seedlings were counted at 14-day intervals. As recorded during the full 7-year trial period, the total seedling numbers did not exceed 21% of the seeds sown and at the end of the period almost no intact seeds of A. fatua remained and none of A. ludoviciana. Seeds of A. ludoviciana appeared to survive in the soil for 33 months after sowing, compared with 61 months for A. fatua. Both species retained a high level of viability during dry storage for up to 4 years and for up to 8 years in the case of A. ludoviciana. Seeds of A. fatua survived longer at soil depths of 15 cm than at 5 cm; with A. ludoviciana the differences were less obvious. A. fatua seed germinated in spring and autumn and A. ludoviciana in winter, irrespective of age of seed or cultivation treatment; with the latter there was a period ranging from 3 weeks to 3 months between December and March, depending on weather conditions, when no germination occurred. A. ludoviciana was slightly more winter-hardy than A. fatua. 80% of A. ludoviciana seedlings appeared in the first autumn and winter; with A. fatua, most seedlings appeared in the second spring. - P.J.B. [O.W.]

708. TUCKER, J.M. (Bot. Dep., Univ. California, Davis, U.S.A.) Studies in the Quercus undulata complex. 1. A preliminary statement. Amer. J. Bot., 1961, 48, (3), 202-8, figs. 5, tabs. 1, bibl. 11.

The taxonomic history of the Q. undulata complex in the southwestern States of the U.S.A. is discussed. - P.J.B. [O.W.]

709. SEGRETAIN, G. and SCHMIDT, P. (Ser. Physiol. veg. Mycol. Inst. Pasteur). Perennite et symbiose de Poa annua L. en montagne. [Perenniality and symbiosis of P. annua L. in mountain regions.] C.R. Acad. Sci. Paris, 1960, 251, (9), 1091-3, (F.f.)

An experiment in which P. annua was grown in sterilized and unsterilized mountain soil and soil from the plain at an altitude of 2000 m led to the conclusion that at that altitude P. annua can only form stolons and assume the character of an alpine perennial when in symbiosis with the mycorrhizal fungi contained in mountain soil. - D.M.L.S. [O.R.]

710. STEINBAUER, G.P. and GRIGSBY, B. (Michigan State Univ., East Lansing, U.S.A.) Dormancy and germination of the docks (Rumex spp.). Proc. Ass. off. Seed Anal., N. Amer., 1960, 50, (1), 112-7, bibl. 16.

The germination responses to temperature, light and moistening agent were studied in seed of Rumex acetosa, R. acetosella, R. altissimus, R. crispus, R. mexicanus, R. obtusifolius, R. orbiculatus (aquatic) and R. verticillatus (aquatic). The seed was of different ages. With freshly-harvested seed, germination was complete in most cases after 14 days, except for R. orbiculatus and R. verticillatus, which required a further 10-14 days. Seed stored in closed, screw-cap bottles for several years suffered little decline in viability, except for R. verticillatus. The most effective germination conditions for all species was alternating temperatures of 20-30°C in light and with water as a moistening agent. R. acetosa showed identical germination in light and darkness and R. acetosella was the only species in which germination was increased by substituting a 0.2% solution of KNO_3 for water. The need for light was much more critical at constant than at alternating temperatures, but could be largely eliminated by scarification. - P.J.B. [O.W.]

711. ROMELL, L.-G. (Djursholm, Sweden). Rödsyran i Norrlands-vallarna. [Sorrel in artificial grassland in Norrland.] K. Skogs-LandbrAkad. Tidskr., 1960, 99, (5-6), 345-50, (Sw.e.), bibl. 21.

The statement "it is a known fact that sorrel thrives best on infertile, lime-deficient soils", made in a paper by Hagsand E. and Thörn, K-G., entitled Norrlandsk vallodling, published in K. Skogs LantbrAkad. Tidskr., 1960, Suppl. 3, is taken as representative of a widely-held misapprehension that Rumex acetosella is an indicator of acid, lime-deficient soil conditions and that it is a lime-hating plant. Evidence from the literature is adduced to show that this view is erroneous. - P.J.B. [O.W.]

712. HAGSAND, E. and THÖRN, K.-G. Rödsyran i Norrlands-vallarna. Svar till professor L.-G. Romell. [Sheep's sorrel in Norrland leys. An answer to Professor L.-G. Romell.] K. Skogs LandbrAkad. Tidskr., 1960, 99, (5-6), 351-4, (Sw.e.).

On the basis of data taken from a survey by the authors of the vegetation of leys in the 4 northernmost provinces of Sweden, correlation coefficients are given of the relationship between the occurrence of Rumex acetosella and the base status of the soil. The correlation coefficients were small, which was attributed to the variability of the material, but in 11 out of 12 areas studied, there was a negative correlation between the base status of the soil and numbers of R. acetosella. Some results of a trial in 1955 on the effect of different lime and phosphate treatments on stands of Spergula arvensis are given, which indicated that applications of both lime and, to a lesser extent phosphate, reduced stands of this weed. The soil in this trial had a pH of 5, a base number of <0 and very low potash and phosphate status. - P.J.B. [O.W.]

713. WIEHE, P.O. (Sugar Res. Inst., Mauritius). Notes on the present ecological status of Cordia macrostachya in Mauritius. Bull. Ent. Res., 1960, 51, (1), 132-3.

Since the introduction of the 2 insects Schematiza cordiae and Eurytoma sp., the impenetrable undergrowth formerly formed by C. macrostachya in lowland scrubs and thickets has completely disappeared and it is now only a subordinate constituent of the vegetation. - D.M.L.S. [O.R.]

714. KROCHMAL, A. (W. Carolina Coll., Cullowhee, North Carolina, U.S.A.) Germination studies of aerial bulblets of Allium vineale L. and A. canadense L. Amer. Midland Nat., 1960, 63, (2), 497-508.

Freshly harvested bulblets of A. vineale placed at storage temperatures of 33°F and 40°F were dead after 5 months; bulblets of A. canadense had the dormancy period shortened

by storage at 33°F and 40°F; bulblets of both species are incapable of germination after storage at room temperature for 3 years. Small bulblets of both species have a lower germination rate than do large bulblets; small bulblets of A. vineale lose viability more rapidly than do large bulblets. Shrinkage of the fleshy portion of the bulblet is considerably greater than shrinkage of the papery outer covering; serious injury decreases germination of both species; basal and longitudinal sections of bulblets of both species are capable of germination, upper portions are not; bulblets of A. vineale lacking red colour are capable of germination, but at a lower rate than red bulblets. Wheat (Triticum aestivum) and crimson clover seeds (Trifolium incarnatum) are not harmed by storage with bulblets of either species. - Plant Sci., 35.68124.

715. MANN, L.K. and LEWIS, D.A. (Univ. California, Davis, California, U.S.A.) Rest and dormancy in garlic. Hilgardia, 1956, 26,(3),161-89, figs.12, tabs.1, bibl 46. [209(79.4)]

716. HAWKSWORTH, F.G. and GILL, L.S. Rate of spread of dwarf mistletoe in ponderosa pine in the Southwest. U.S.For.Serv. Rocky Mountain For. & Range Exp.Sta.Res. Notes, 1960, 42, pp.2, figs.1.
The first infections from a young stand are entirely from seeds ejected from the dwarfmistletoe (Arceuthobium vaginatum f. cryptopodum) plants in an old tree. Lateral spread begins after 20 to 30 years. At points beyond the limits of seed discharge from the source tree, or when the source tree dies, all spread is lateral. The mean spread from overstorey trees into dense stands 41 years of age was 51 ft; for open-canopied stands 34 years of age the spread was 59 ft. There was no relation between compass direction and distance from the seed source. - J.W.F. [O.F.]

717. ANDREWS, S.R. and DANIELS, J.P. (Rocky Mountain For.& Range Exp.Sta., State Univ., Fort Collins, Colorado U.S.A.) A survey of dwarfmistletoes in Arizona and New Mexico. U.S.For.Serv.Rocky Mountain For.& Range Exp.Sta., Sta.Paper, 1960, 49, pp.17, figs.4, tabs.7, bibl.7.
In a survey during 1954-7 general observations on the distribution of dwarfmistletoes (Arceuthobium spp.) were made along more than 3400 miles of road in one phase, while in another phase, 3000 quarter-ac circular plots were established to give a 0.01% sample of the regions commercial sawtimber area. Results are given. - J.W.F. [O.F.]

718. GRAHAM, D.P. (Div.For.Disease Res., Ogden, Utah, U.S.A.) Dwarfmistletoe survey in Kaniksu National Forest. U.S.For.Serv. Intermountain For. & Range Exp.Sta., Res. Note, 1960, 74, pp.6, figs.1, tabs.3.
Estimates of the distribution and abundance of dwarfmistletoe (Arceuthobium spp.) were obtained by a roadside survey in 1959. - J.W.F. [O.F.]

719. GRAHAM, D.P. (Div.For.Disease Res., Ogden, Utah, U.S.A.) Dwarfmistletoe survey in Nezperce National Forest. U.S.For.Serv. Intermountain For. & Range Exp.Sta., Res. Note, 1960, 75, pp.7, figs.1, tabs.3.
Results are given of a survey of dwarfmistletoe (Arceuthobium spp.) occurrence along roadside strips, and of a more detailed study of dwarfmistletoe damage on sample plots established in infected stands. - J.W.F. [O.F.]

720. SRIVASTAVA, L.M. and ESAU, K. (Dep.Bot., Univ.California, Davis, U.S.A.) Relation of dwarfmistletoe (Arceuthobium) to the xylem tissue of conifers. 1. Anatomy of parasite sinkers and their connection with host xylem. Amer.J.Bot., 1961, 48,(2),159-67, figs.31, bibl.30. [O.W.]

721. SRIVASTAVA, L.M. and ESAU, K. (Dep.Bot., Univ.California, Davis, U.S.A.) Relation of dwarfmistletoe (Arceuthobium) to the xylem tissue of conifers. 2. Effect of the parasite on the xylem anatomy of the host. Amer.J.Bot., 1961, 48,(3),209-15, bibl.18.
Changes in xylem anatomy induced in 7 species of conifers by Arceuthobium campylopodium and A. americanum were studied. - P.J.B. [O.W.]

722. GUPTA, S.C. (Govt Coll., Naini Tal, India). Secondary growth in Urtica dioica L. Agra Univ.J.Res.Sci., 1960, 9,(1),93-102.
Secondary growth in stem, root and in the leaf when cultured, is described. - From Plant Sci., 36, 15028 (modified). - D.M.L.S.

723. NILSSON, B. Metoder för laboratorie-

bestämning av olika havrearter. [Laboratory methods for identifying Avena species.] Medd. Frökontrollanst., Stockh., 1959, (34), 83-4, (Sw.e.)

Besides morphological methods for identifying Avena spp., a new method is described in which hulled, pre-soaked seeds are stained by a 2% phenol solution. The seeds are kept on filter paper moistened by the solution in closed Petri dishes for 2.5 hours. Differences in degrees of dark staining make it possible to distinguish between species, e.g. A. sativa from A. fatua. - Herb.Abstr., 31,401.

724. ROBINSON, A.G. (Dep.Ent., Univ. Manitoba, Winnipeg, Canada). Effect of maleic hydrazide and other plant growth regulators on the pea aphid, Acyrthosiphon pisum (Harris), caged on broad bean, Vicia faba L. Canad.Ent., 1960 92,(7),494-9, figs.1, tabs.6, bibl.7.

The lower double leaves of broad bean plants 1-3 in. high were dipped for 5 seconds in solutions of the following compounds: MH 2000-40 000 p.p.m., 2,4-D 0.01-1000 p.p.m., 2,4,5-T 0.001-0.1 p.p.m., MCPA 0.1-10 p.p.m., 2,4-DES 2000-8000 p.p.m., erbon 100-10 000 p.p.m., barban 10-8000 p.p.m. and potassium gibberellate 1-1000 p.p.m. None of the treatments caused obvious adult or nymphal mortality, or affected aphid fecundity.

When MH was applied to the vermiculite in pots and absorption by bean roots allowed to continue for 48 hours, all tests showed nymphal mortality and reduced fecundity of aphids caged for 5 days on treated plants, even when females were removed and placed for a further 5 days on untreated plants. Average fecundity was also greatly reduced in females which had spent their nymphal instars on treated plants. A direct contact spray of MH at 4000 p.p.m. caused no toxicity to adult aphids and had no effect on fecundity. - D.M.L.S. [O.R.]

AQUATIC AND WOODY WEEDS AND THEIR CONTROL

725. van der LINGEN, L., PHIPPS, J.B. and TEMPLETON, H.A. Weed control in dams and irrigation channels. Rhod.agric.J. 1960, 57,(5),353-8, tabs.2, bibl.6.

A short review (with reference to Rhodesia) covering control by mechanical, biological and chemical means. It includes the following information: ducks, and at higher altitudes, swans, give good control of submerged, floating, and some emergent weeds, Pekin and Rouen ducks being superior to Muscovy ducks. Tilapia melanopleura will give good control of Nymphaea spp. if they have been cut first; for rapid results 500 small fingerlings/ac are needed, but 50-100 or ca. 5 # will ensure control within a year, provided conditions for their survival are good.

Polygonum senegalense can be controlled by 2,4-D 3 # or 2,4,5-T 3 #. Pending the results of current experiments, PCP (sodium) 25 # in 60 gal water is suggested for Salvinia auriculata.

The mechanical equipment briefly described includes boats, raking and cutting implements and sprayers. - D.M.L.S. [O.RE.]

726. WOODFORDE, A.H. (Dep.Agric., Hobart Tasmania). Rivers blocked by reed sweet grass (Glyceria maxima). Tasm.J.Agric., 1960, 31,(2),189-90, figs.1.

G. maxima has extensive creeping rhizomes and when established close to shallow rivers and streams tends to spread into the water where it forms a dense growth and eventually obstructs the flow of water. Farmers are urged not to plant it near rivers or streams and, where established, to prevent its spread by cultivating a strip along the margin nearest the water or by spraying any growth tending to spread towards the water. Dalapon 20 # applied in the autumn is recommended. - D.M.L.S. [O.RE.]

727. BARTHELMES, D. (Inst.Fischereiwesen der Humboldt-Universität zu Berlin, Berlin-Friedrichshagen, E.Germany). Ein Fall von natürlichem Gelegerückgang. [A case of natural stand regression.] Z.Fisch., 1959, 8,(7/8),551-56, (G.e.)

A brief note is given on the thinning-out of Phragmites communis stands fringing the west shore of the Müggelsee. This was attributed to the considerable drifting of ice on to the west shore of this lake in March, 1958, at a time when the current year's shoots had already reached a relatively large size and were unprotected owing to the removal of much of the previous year's stand by drifting ice in December, 1957. - P.J.E. [L.AM.]

728. RATTRAY, J.M. (Matopos Res.Sta., Rh.

Rhodesia & Nyasaland). Bush control experiments. Rep.Sec.Fed. Minist.Agric.Rhod. & Nyasald 1959, 1960, 103-4.
Experiments at Matopos indicated that a good fire every 3 or 4 years at the end of the dry season before the rains set in effectively controlled bush, with no deleterious effect on the grass. Two burns in successive years at the end of the dry season at intervals of 6-8 years also gave satisfactory control of bush. Frequent burning on red sandy loam caused Heteropogon contortus to become dominant, but where burning took place at 3- or more year intervals Themeda triandra dominated. At Matopos, ring barking, diesel fuel or 2,4,5-T (butyl ester) applied in dieseline killed Acacia karroo. A. nigrescens and A. nilotica. Only the 2,4,5-T treatment killed A. gerrardii.- Herb.Abstr., 31,251.

729. VALENTINE, M.A. and NORRIS, J.J. Mesquite control with 2,4,5-T by ground spray application. Bull.New Mexico agric. Exp.Sta., 1960, 451, pp.24, figs.8,tabs.4, bibl.29.
In tests during 1951-5, mesquite (Prosopis juliflora) plants were treated individually with concentrations of 0.1% of the following: 2,4,5-T propylene glycol butyl ether (PGBE) esters; pentyl ester, isopropyl ester, tetrahydrofurfural ester, ethyl amine and mixed ethanolamine salts, 2,4 5-TP PGBE esters, 2,4-D PGBE esters and pentyl ester. Herbicidal effectiveness differed highly significantly between years. Only the 2,4,5-TP and amine formulations of 2,4,5-T gave significantly poorer control of mesquite than did 2,4,5-T PGBE esters. No formulations exceeded 2,4,5-T PGBE esters in effectiveness, though the pentyl ester equalled it. In further trials, 2,4,5-T PGBE esters at concentrations of 0.1, 0.15, 0.2 and 0.25% were used. Differences in effectiveness between concentrations were not significant, but the 0.15% concentration consistently gave the best or nearly best results. In tests of different additives, the following were used with 2,4,5-T PGBE esters (0.1% concentration): non-phytotoxic mineral seal oil at 2, 4 or 8%, detergent Multifilm L colloid, Du Pont spreader-sticker and Thompson Emulsifier H.S. 31. The use of an oil additive resulted in consistently better control of mesquite than where no additive was used, though the differences were not significant. In date-of-spraying trials, there was a sharp peak of effectiveness for sprays applied in early June in 5 out of 6 of the trial years. At this time there was full development of leaf cover; effectiveness of spraying remained high until the fruit was fully elongated, but still flat and green. High rainfall in the autumn/spring period was associated with good kills after spraying. Costs of control are given. - P.J.B. [17(78.9)]

730. SOUTH AFRICA, DEPARTMENT OF FORESTRY. Weed killers [for the control of eucalypts.] Rep.Dep.For.S.Afr.1957/8, 1960, (13).
In Zululand experiments were carried out in which stumps of Eucalyptus maculata and E. paniculata were treated with 2,4-D and 2,4,5-T. A 1:40 solution of 2,4-D in paraffin killed 90% of E. maculata stumps and a 1:30 solution of 2,4,5-T killed all E. paniculata stumps. A 1:20 solution of 2,4-D in paraffin killed E. saligna stumps up to 7 in. in diameter. - From For.Abstr., 22,700. - P.C.

731. RICHARDSON, J.M. Herbicidal control of rain forest regrowth. Papua New Guinea agric.J., 1960, 13,(2),66-9, figs.21.
A trial area in the Territory of Papua and New Guinea was cleared in 1953, regrowth felled and burnt in late 1957, and herbicides applied in April 1958 following topping to 2 ft or scalping to 2 in. The main species present were Imperata cylindrica, Cynodon dactylon, Paspalum sp., Sorghum sp., Pteridium sp., Passiflora sp., and several tree species. Polyborchlorate (sodium pentaborate 50%, sodium tetraborate 15%, sodium chlorate 25%) 8-32 lb, ATS 4-16 lb and TCA 1.5-6 lb (rates are per 400 ft^2) were not persistent, and Concentrated Borascu (sodium borate ore) 20-80 lb gave only fair control. Ureabor (disodium tetraborate pentahydrate 63.2%, disodium tetraborate decahydrate 30.8%, 3-p-chlorophenyl-1,1-dimethylurea 4% at 14 lb and monuron at 1 and 2 lb gave very good weed control for the 6 month trial period. It is suggested that Ureabor 7 lb or monuron 0.5 lb followed by spot treatments of regrowth might be as effective and would be more economical. - D.M.L.S.
[2(95)]

732. MORHAUS, G.H. and van SANTEN KOLFF, L.F. Investigations on the poisoning of tropical rainforests for land-reclamation and wood-exploitation purposes. Neth.J. agric.Sci., 1961, 9,(1),17-26, tabs.4, bibl.3.

The trials reported were carried out in Sumatra during 1955-7. In trials in 1955/6, marketable timber trees were girdled (single or double girdles), barked (strip at least 5 cm wide removed) or notched, followed by the application of sodium arsenite at concentrations of 6-30%, or AMS at concentrations of 20% ranging up to the crystalline solid. Differences between tree species in reaction to the treatments varied widely. At 8 months after treatment, sodium arsenite gave up to 90% kill when applied to girdled or barked trees, though kill of girdled trees was somewhat better. Kill % rose as the concentration of sodium arsenite increased. AMS gave average kills ranging up to 48%. Girdling or barking alone gave kills of up to 20% and were both similar in effectiveness. In trials in 1956/7, the following were applied to girdled trees: sodium arsenite 5-50%, sodium arsenite 5-50% applied before root cutting, 2,4,5-T 1.5 or 3% a.e. in water or diesel oil, and Trioxone (principal ingredient 2,4,5-T) 1.5 and 3% in water or diesel oil. 2,4,5-T and Trioxone in oil or water were relatively ineffective. Sodium arsenite at 20% gave a kill of >60% after 5 months, while 25% gave a similar degree of kill after 4 months. - P.J.B. [O.W.]

OTHER WEEDS AND THEIR CONTROL

See also 646,707.

733. PERMIN, O. Jordbearbejdningens betydning for bekaempelse af rodukrudt. [The importance of cultivations for the control of rhizomatous weeds.] Tidsskr. Planteavl, 1961, 64,(5),875-80, (Dan.)

In 3 series of trials at different locations during several years in Denmark, the effect of different stubble cultivation treatments on populations of Agropyron repens, Cirsium arvense and Sonchus arvensis was studied. In the first trial series, the following treatments were used (one year only): (a) controls, normal winter ploughing only, (b) cultivation with heavy harrow 2-3 times over, (c) skim-ploughing to a depth of 10 cm, followed by light harrowing 1 or 2 times over, (d) deep ploughing (20-25 cm deep), followed by light harrowing 1 or 2 times over. The treatments were applied shortly after harvest and were followed by normal winter ploughing. No treatment significantly affected the yields of subsequent cereal and root crops. Treatment (c) caused the greatest reduction in all 3 weed species. In 28 trials, treatments (b) and (c) reduced stands of A. repens by an average of 55 and 65%, respectively, those of C. arvense were reduced by 24 and 33% in 11 trials and those of S. arvensis by 40 and 50% in 4 trials. Where cereals were the subsequent crop, the effect of cultivation on A. repens varied greatly. Where deep ploughing was followed by harrowing, but with no winter ploughing, stands of all 3 weeds increased, indicating that a late, deep ploughing was necessary for effective control in conjunction with the cultivations. In a second trial series the results indicated that disc ploughing was less effective than skim-ploughing against all 3 species. In a third trial series, 2 deep ploughings in mid-August and mid-September did not give better control of the 3 species than skim-ploughing. Where eelworm was present, cultivations to control weeds appeared to increase the severity of its attacks. - P.J.B. [105(481)]

734. RICHTER, W. Zwei gefärliche Grünlandunkräuter. [Two dangerous pasture weeds.] Landwirtschaftsbl.Weser-Ems, 1960, 18,(5),pp.2, (G.), figs.5.

A note is given on the rapid spread of Veronica filiformis and Allium vineale, which have become serious weed problems in certain districts of Germany. - P.C. [257(43)]

735. SCHWARZ, R. Der Weisse Germer, ein Almunkraut. [Veratrum album, a weed of the Alps.] Prakt.Bl.f.Pflanzenbau u.Pflanzenschutz, 1959, 54,(6),205-15, figs., bibl.8.

An account is given of the biology and control of Veratrum album, a persistent and poisonous weed which is widespread on the richest soils of mountains in Europe. Its occurrence ranges from 500 m altitude up to and above the tree limit. Three-year trials on the control of this weed in Bavaria have shown that mowing alone is of little value. Spraying with growth substances was much more successful. The best proved to be 2,4-D ester at 3 l/ha. 2,4-D ester at 1.5 l/ha, or MCPA ester at 3 l/ha were also effective. The 2,4-D ester selected for this alpine situation was Utox E, because its action is said to be independent of temperature and rainfall. Dikofag MCPA ester was chosen because it does not harm grass and is suitable in localities liable to sudden heavy rainfall. Treatment with growth substances should be accompanied by mowing; further infestation

can be prevented by cutting off all inflorescences before blooming. - Herb. Abstr., 31,247. [278(43)]

736. WEIR, H.L. (Arkansas State Plant Board, Little Rock, Arkansas, U.S.A.) Germination of Johnson grass. Proc. Ass. off. Seed anal. N. Amer., 1959, 49, (1), 82-3.
Samples of Johnson grass [Sorghum halepense] seed were germinated at 20 and 30°C (a) on receipt of seed and (b) 8 months later. Percentage germination after 35 days was 70% for (a) and 68% for (b) for one sample, and 25% for (a) and 16% for (b) for the other. Glumes were removed from the ungerminated seed, and the test continued for 17 months, by which time a further 50% had germinated. Where 5 samples were germinated for 35 days at alternating temperatures of 20/35°C or 30/45°C, germination at the higher temperatures occurred mostly during the first 11 days, and at the lower temperature between 14 and 28 days after the beginning of the test. Percentage seed germination was approximately the same under both ranges of temperature. - From Herb. Abstr., 30,960. - P.C.

737. SLIFE, F. and KNAKE, E. Controlling Johnsongrass in Illinois. Circ. Univ. Illinois Coll. Agric. Ext. Serv., 1961, 827, pp.7, figs.9.
Recommendations for the control of Sorghum halepense in different circumstances are given and include the use of cultural measures, sodium chlorate and dalapon. - P.J.B. [31(77.3)]

738. GONZALEZ FRANCO, J. Represion de la maleza Echinochloa colonum (L.) Link (Liendre de puerco) en Arrozales. [Control of the weed E. colonum (L.) Link in rice fields.] Acta Agron. (Palmira), 1959, 9, (3/4), 203-25, (Span.e.).
Of various herbicides tried, TCA 9.4 kg/ha, applied at least 5 days after irrigating or flooding and at least 20 days before sowing rice, has given the best economic results. - From Plant Sci., 36, 11956 (modified). - D.M.L.S.

739. RATTRAY, J.M. (Matopos Research Sta., Fed. Rhod. & Nyasaland). Control of Dichapetalum cymosum. Rep. Sec. Fed. Minist. Agric. Rhod. & Nyasald 1959, 1960, 104.
Trials indicated that spraying with the butyl ester of 2,4,5-T or 2,4-D would kill up to 70% of Dichapetalum cymosum. - Herb. Abstr., 31,250.

740. LEUCHS, F. (Biol. Bundesanst. Inst. Gemüsekrankheiten u. Unkrautforsch., Fischenich/Köln, W. Germany). Untersuchungen über Okologie und Bekämpfungsmöglichkeiten des Huflattiches (Tussilago farfara L.) 1 Teil: Zur Okologie des Huflattiches und Bekämpfung durch Kulturmassnahmen. [Experiments on the ecology and control of Tussilago farfara L. Part 1: Ecology and control by cultivation.] Weed Res., 1961, 1, (1), 32-43, (G.e.f.), figs.2, tabs.1, bibl.10.
Rhizomes of T. farfara collected after flowering contained about half as much insulin and reducing sugars as those in which flowering was prevented by herbicides. Rhizome fragments 1 cm long and 3.5 mm in diameter were unable to emerge from depths greater than 4-5 cm in the soil. It was concluded that agricultural crops under normal conditions shaded the ground to at least the same extent as trees growing in plantations, under which T. farfara is normally unable to survive because of lack of light. T. farfara seedlings were suppressed when grown in competition with Galinsoga quadriradiata. It was considered that the abundance of T. farfara on uncultivated areas was due not to any preference for the soils on such areas, but to lack of competition. Rhizomes of T. farfara continued growth at 2-3°C and during frost-free periods in winter. Rhizomes buried beneath 75 cm of compost soil in September emerged by the following March. Under experimental conditions, rhizomes penetrated to a depth of 16 cm only during their first year of growth, but to much greater depths during their second year; this applied both to plants grown from seed and from rhizomes. It was concluded that in fields receiving regular cultivation, T. farfara rhizomes would not be able to grow beneath plough depth and that T. farfara could be controlled by growing crops which form a dense canopy, combined with intensive cultivation between harvest and the next crop. - From Summary. - P.J.B. [O.W.]

741. REHBEIN, C.A. (P.O. Box 122, Gordonvale, Meringa, Queensland, Australia). Prickly cucumber control. Cane Grs' quart.

Bull., 1960, 24, 10-12.
The following treatments were applied with a knapsack spray to African or prickly cucumber (Cucumis metuliferus) growing in sugar cane: (1) 2,4,5-T 80% w/v as butyl ester at 1.0 and 0.5 pints/ac in 100 gal water, (2) 2,4-D 17.8% w/v as ethyl ester + 2,4,5-T 16.4% w/v as butyl ester at 6.67 pints/ac in 100 gal water, and (3) amitrole 50% a.i. at 18.75 and 12.5 %. Two weeks after treatment, (1) and (2) had caused complete kill of cucumber. The higher rate of (3) caused death in some cases, but slightly injured the sugar cane; however, after 5 weeks, treatment (3) had also eliminated the cucumber. It was concluded that treatment (1) at 0.5 % would give rapid control of cucumber at a cost of approximately £1/ac for material. treatment (2) gave slower control at approximately the same cost; and (3) was too expensive to be satisfactory. - J.W.F. [C.A.]

742. CAMPBELL, M.H. (Exp. Farm Bathhurst New South Wales Australia). Identification of serrated tussock (Nassella trichotoma (Nees) Hack). Agric.Gaz.N.S.W., 1960 71,(11),561-73, figs.10 bibl.3.
Identification of N. trichotoma is easy as soon as flowering material is present. This article provides a detailed illustrated guide to identification in the absence of seed heads to facilitate distinction from other tussock grasses on the Central Tablelands of New Zealand. A description and drawings of seeds are included. - D.M.L.S. [O.W.]

743. CAMPBELL, M.H. (Exp. Farm, Bathhurst, New South Wales, Australia). A method of eradication of serrated tussock (Nassella trichotoma (Nees) Hack) on non-arable areas, by the use of herbicides and improved plant species. Proc.2nd Aust. Weeds Conf., 1960, Pap.11, pp.6, tabs.3.
Application of dalapon and TCA in autumn 1957 after burning-off the N. trichotoma, followed by oversowing of pasture species in 1957 and again in 1958, resulted in complete eradication of adult tussock in 1957, but only partial control of seedling tussock in 1959-60. The disadvantage of this technique is the long phase between the killing of the old tussock and the replacement by improved species, during which regeneration of tussock from seed occurs. In the control plots (no chemical treatment) the oversown clovers became established and spread, and it is suggested that if herbicides were applied while the clover is dormant or at a resistant stage, immediate replacement of the weed would be possible. - D.M.L.S. [O.W.]

744. CAMPBELL, M.H. (Exp. Farm, Bathhurst, New South Wales, Australia). Competition between Nassella trichotoma (Nees) Hack and Trifolium subterraneum on non-arable land. Proc.2nd Aust.Weeds Conf., 1960, Pap. 12, pp. 12 figs.2, tabs.2.
From the results of a trial over 4 years the effects of burning (pre-sowing ± overburning 1 year later while clover was dormant) and of superphosphate (SP) rates (0-5 cwts/ac) on the establishment of subterranean clover broadcast into an unploughed area infested with N. trichotoma and the competitive effects of the clover in relation to N. trichotoma, are analysed. The competitive effect of the clover on the tussock became marked in the 2nd year after sowing and continued in the 3rd. Whereas the burning treatments did not appear to help in killing the tussock, superphosphate was of prime importance and 3 cwts/ac appeared to be the best rate. Nitrogen applied to the soil by the subterranean clover increased the crude protein content of N. trichotoma by as much as 100%. Small quantities of the higher protein plants were grazed by sheep when allowed access. Superphosphate at 1 cwt/ac satisfied the requirements of N. trichotoma. - D.M.L.S. [O.W.]

745. CAMPBELL, M.H. (Exp. Farm, Bathhurst. New South Wales, Australia). The eradication of serrated tussock (Nassella trichotoma (Nees) Hack) on semi-arable areas by the use of chisel plough and pasture improvement. Proc.2nd Aust.Weeds Conf., 1960, Pap. 13, pp.9, tabs.3, bibl.1.
Five chisel plough treatments (two with 3 ploughings, two with 2, and one with 1) prior to drilling and pasture mixture were compared. The treatments with 3 ploughings were the most successful, but did not completely remove the tussock. Where 2 ploughings were done, a summer fallow between ploughings greatly enhanced the kill. Results from only 1 ploughing compared favourably with results from aerial sowing of unploughed areas and allowed satisfactory establishment of Phalaris tuberosa and other species. Deferred grazing after sowing resulted in a high proportion of tussock seedlings being smothered, in all treatments, by improved pasture growth, but some seedlings still remained in spite of 2 years' deferred grazing in winter, spring and summer. - D.M.L.S. [O.W.]

746. VENEZUELA, SHELL AGRICOLTURA. El herbicida eptam resulta eficaz contra el corocilla. [Eptam effective against nutgrass.] Not.agric.Serv.Shell Agric., Cagua, 1959, 2,41-2.
The promise previously shown by Eptam (72% EPTC) against nutgrass [Cyperus rotundus] has been confirmed. The best results were obtained by harrowing and ploughing, then incorporating EPTC 14.4 kg/ha (as Eptam). - From Hort.Abstr., 30, 5313 (modified). - D.M.L.S.

747. RINCON, D.J. (Servicio Shell,Secc. Agron.,Venezuela). Mediante el empleo de sustancias quimicas: control del corocillo o coquillo. [Control of "corocillo" or "coquillo" (nutgrass) by chemicals.] Ing.Agron.(Venezuela), 1960, 4,23-30, figs. 2,tabs.5,bibl.41.
Chemical control methods are reviewed and trials in Venezuela since 1954 described. EPTC (incorporated) was more effective than 2,4-D (Shell 40, 20-30 l/ha commercial product), monuron 10-20 kg/ha, TCA (sodium) 65-100 kg/ha, amitrole 2-16 kg/ha, dalapon 10-20 kg/ha, and dalapon/amitrole mixtures at 10 + 2 and 20 + 4 kg/ha, none of which gave lasting control. When rototilled into the soil EPTC 10 and 20 kg/ha gave 90 and 94% control for at least 3 months; in the dry season 7.5 kg/ha gave good control for 3 months. Carrots and lucerne sown 3 weeks after incorporation of EPTC 7.5 kg/ha were not affected, but cotton and sesame were susceptible even to 2.5 kg/ha. Maize was injured by 7.5 kg/ha when sown 3 weeks after treatment, but when sown 4 weeks after was only injured by rates of 10 kg/ha or higher. D.M.L.S. [10(87)]

748. RACOVITA, A. Raspindirea lupoaiei ramificate (Orobanche ramosa L.) in cultura tutunului din R.P. Romina. [The spread of broomrape (O. ramosa) in tobacco grown in the Rumanian P.R.] Lucr.Inst.Cerc.Alim., 1959, 4,209-14, (Rum.f.russ.), bibl.3.
A survey in 1957 showed infestation by broomrape in 7.6% of the tobacco area of Rumania. - P.J.B. [Md.H.]

749. RACOVITA, A. Contributii la cunoasterea plantelor gazda si stimulente ale lupoaiei ramificate (Orobanche ramosa L.) [A contribution to the knowledge of host and stimulant plants for broomrape (O. ramosa L.). Lucr.Inst.Cerc.Alim., 1959, 4,215-21, (Rum.f.russ.), bibl.12. [Md.H.]

750. RACOVITA, A. [Chemical control of the tobacco disease due to Orobanche ramosa L.] Ind.Aliment.Prod.Veg., 1959, 11, 135-8.
Of several chemicals tested Hedolit (based on DNOC) applied at 50 ml/plant of a 0.5% or, better, a 0.75% solution was most effective, causing the parasite to dry up completely. - Hort.Abstr., 31,921.

751. KELLEY, J.W. and GRAHAM, D.P. Dwarfmistletoes (Arceuthobium spp.) of the Intermountain and Northern Rocky Mountain regions and suggestions for control. U.S. For.Serv.Intermountain For.& Range Exp. Sta.,Res.Paper, 1960, 60, pp.16, figs.11, bibl.8.
The major mistletoe species found in these regions are A. americanum A. douglasii, A. campylopodium forma campylodium, A. campylodium f. laricis, and A. vaginatum. Their germination and growth, means of spread, and the symptoms of infection on the host species are described. Suggested methods of control are (1) the eradication method, which consists of removing all infected trees or branches by cutting, burning or poisoning, and (2) the stand manipulation method, which consists of converting an infected stand to one consisting of tree species not susceptible to the dwarfmistletoes present in the area. - J.W.F. [O.F.]

752. SALENTINY, TH. (Services Agricoles, Luxembourg). Durch die Rübenrassa des Stockälchens "Ditylenchus dipsaci" hervorgerufene Schadbilder bei einigen unkrautarten. [Damage to certain weeds due to the eel-worm Ditylenchus dipsaci.] Nematologica, 1959, 4, 142-6, figs.12, bibl.4.
Observations are recorded on the injury and symptoms caused to various weeds by Ditylenchus dipsaci derived from sugar beet. The most marked symptoms, which included splitting of tissue, malformation of stems and leaves, and ultimate decay of attacked parts, were shown by Aethusa cynapium, Avena fatua, Polygonum convolvulus, Polygonum persicaria and Sonchus arvensis. - P.C. [O.RE.]

753. WAIN, R.L. New Chemicals for agriculture. New Sci., 1960, 8,(191),133-5. A brief review. [454(42)]

754. CRONSHEY, J.F.H. (I.C.I.Ltd., Jealott's Hill Res.Sta.,Bracknell,Berks, England). A review of experimental work with diquat and related compounds. Weed Res., 1961, 1,(1),68-77, (E.g.f.), tabs.1, bibl.33.

The activity and mode of action of diquat-ernary salts of dipyridyls are reviewed, together with the results of field trials with diquat and investigations of mammalian toxicity and residues on crops. Possible uses for diquat and related compounds are discussed. - P.J.B. [O.W.]

755. LEMIN, A.J. and SWANK, G. (The Upjohn Co.,Kalamazoo,Michigan,U.S.A.) The pre-emergence herbicidal activity of N,N-dialkyldiphenylacetamides. Chem. & Ind., 1961, (17),552-3, bibl.2.

A number of N,N-dialkyldiphenylacetamides were prepared by reacting diphenylacetyl chloride with the appropriate amines and tested by spraying them at rates of 1, 2, 4 and 8 # on to the surface of soil-filled trays in which the seed of different crops and weeds had been sown. At 8 #, N,N-dimethyldiphenylacetamide completely inhibited the germination of Digitaria sanguinalis, Setaria viridis, Sorghum halepense, Poa pratensis, Festuca rubra, Agropyron repens, Avena fatua and ryegrass. The germination of wheat was partly suppressed, but not that of groundnuts. This compound completely suppressed the germination of D. sanguinalis, S. viridis, Poa pratensis and F. rubra at 1, 2 and 4 # also. The effect of increasing the chain length of the N,N-dialkyl groups was examined. N,N-diethyldiphenylacetamide at 4 and 8 # was comparable to the N,N-dimethyl compound in activity, except that wheat and ryegrass were tolerant to it. At low rates, N,N-diethyldiphenylacetamide suppressed the growth of S. viridis and Poa pratensis, only. N,N-dibutyldiphenylacetamide was inactive at 8 #. N,N-diallyldiphenylacetamide at 4 and 8 # was similar to the N,N-diethyl compound in activity. Mono-alkyl substitution resulted in non-activity. The activities of diphenylacetonitrile and diphenylacetamide were also tested. It was considered that as soybeans, cotton and groundnuts tolerate N,N-dimethyldiphenylacetamide at 8 # and beans, carrots, radishes onions and potatoes tolerate at least 2 #, this compound may find commercial use. It appears to have a moderately long-term residual effect. - P.J.B. [O.W.]

756. YOKOYAMA, K. and MUNAKATA, K. (Dep. Pharmacognosy,Univ.Illinois,Chicago 12,U.S.A.) Herbicidal activities of halogenoalkylcarboxylic acid esters. II. Effects on seedlings. Bot.Gaz., 1960, 122,(1),67-9, tabs.1,bibl.8.

A series of halogenoalkylcarboxylic esters were tested on seedlings of rape, millet and tomato at concentrations of 0.1 and 1.0% (w/v) on 2 week old seedlings, and evaluated at the end of the 4th week. Allyl chloroacetate and allyl dichlorobutyrate were relatively non-toxic to seedlings, although they are effective seed killers. Allyl and butoxyethyl dichloropropionate were markedly toxic to millet, but had only slight effects on rape and tomato seedlings; the opposite was true for the bromo- and iodoacetate compounds. The allyl bromo- and iodoacetates are volatile, toxic and lachrymatory and thus were difficult to handle compared with the other compounds tested. The benzyl and butoxyethyl halogenoacetates were among the most active compounds in terms of toxicity to the seedlings tested, their toxicity being on a level with that of CDAA. - From Authors' Summary. - P.C. [O.W.]

757. TORGESEN, D.C. and HAYNES, E.L. (Boyce Thompson Inst.,Yonkers 3, New York,U.S.A.) Nematocidal properties of diphenyl sulfide. Contrib.Boyce Thompson Inst., 1961, 21,(1), 11-19, bibl.6.

Diphenyl sulphide was as effective in the laboratory against Meloidogyne sp. as 1,2-dibromo-3-chloropropane (Nemagon), sodium N-methyldithiocarbamate dihydrate (Vapam) and 3,5-dimethyltetrahydro-2H-1,3,5-thiadiazine-2-thione and ethylene dibromide and more effective than D-D mixture and PRD*. Diphenyl sulphide gave a good kill of Meloidogyne sp. in the field and had a half-life in the soil (Norfolk sandy loam in N. Carolina) of about 3 weeks. The compound was toxic to seeds and seedlings, but established perennials (Rosa multiflora rootstocks, Buxus sempervirens and Ligustrum vulgare) appeared to be resistant and it seemed to offer most promise as a pre-sowing nematocidal treatment. - P.J.B. [O.W.]

758. GERARDE, H.W. Toxicology and biochemistry of aromatic hydrocarbons. Elsevier Publ.Co.,London, 1960, pp. xiv + 329, 30/-. From Chem. & Ind., 1961, 19,629.

* PRD = 3,4-dichlorotetrahydrothiophene-1,1-dioxide.

759. DECKER, G.C. (Agric.Exp.Sta., Urbana, Illinois, U.S.A.) Agricultural chemicals. Fed.Proc., 1960, 19,(3 II), 17-21, bibl.48.
A review of the toxicological problems associated with pesticides. - D.M.L.S. [O.R.]

760. RIDEN, J.R. and HOPKINS, T.R. (Spencer Chem.Co., Kansas City, Missouri, U.S.A.) Decline and residue studies on 4-chloro-2-butynyl N-(3-chlorophenyl) carbamate. J.agric.Fd Chem., 1961, 9,(1), 47-9, figs.1, tabs.2, bibl.12.
The determination of barban decline and residues in barley, flax, peas, sugar beet and wheat by a method based on the colorimetric determination of 3-chloroaniline is described. Decline studies after application of 0.5 # to peas and flax and 1 # to sugar beet, wheat and barley showed a loss of over 99% within 2 weeks when crops were sprayed at the recommended time and final residues of 0.01 p.p.m. both when sprayed at the normal time or at later than normal (wheat and barley in the boot stage, flax and peas flowering and sugar beet in the 6-8 leaf stage). Residues in the mature crops after harvesting following application of 1 # to flax and peas, 2 # to barley and wheat and 4 # to sugar beet were below 0.01 p.p.m. in all cases. - D.M.L.S. [O.W.]

761. ROSA, M. and MICKOWSKI, J. Ulteriori prove sull'effetto fungicida ed erbicida di alcuni prodotti per la sterilizzazione parziale del terreno. [Further tests of the fungicidal and herbicidal effects of certain soil sterilants.] Boll.Staz.Pat.veg.Roma, 1959, 1960, 17,71-90, (It.), bibl.9.
Tests were made on seed beds at the Tobacco Institute of Prilep, Macedonia, with the following: (1) Vapam (SMDC) 1%, (2) Crag Mylone 85 W (DMTT 85% wettable powder) 0.4%, (3) Bedrench (allyl alcohol + ethylene dibromide) 1.5%, (4) SMDC + allyl alcohol 1:1 at 1%, and (5) DD (1,3-dichloropropene, 1,2-dichloropropane, and other related chlorinated compounds) 30 ml/m² + allyl alcohol 0.75%. The treatments were made 20 days before sowing tobacco seed. All gave good herbicidal results except against Trifolium spp.
Fungicidal effects against Thielaviopsis basicola were equally significant. It was not possible to determine whether the treatments affected the production of tobacco seedlings. Treatments (4) and (5) are not recommended. - Hort.Abstr., 30,5659 (modified). - D.M.L.S.

762. YATAZAWA, M., PERSIDSKY, D.J. and WILDE, S.A. (Dep.Soils, Univ.Wisconsin, Madison, U.S.A.). Effect of allyl alcohol on micropopulation of prairie soils and growth of tree seedlings. Proc.Soil Sci. Soc.Amer., 1960, 24,316-8.
Applications of allyl alcohol at rates of 25-200 gal/ac to mycorrhiza-free Carrington silt loam prairie soil markedly stimulated the growth of Monterey pine seedlings, especially at the highest rate used. This was accompanied by the almost immediate replacement of the native soil fungus population by Trichoderma viride. Rates of >100 gal/ac caused considerable reductions in the soil populations of bacteria and actinomycetes. - P.J.B. [73(77.5)]

763. VOROBEV, F.K. and ABUEVA, A.A. [Effect of the triethanolamine salt of 2,4-D on nitrogen metabolism.] Dokl.s-kh. Akad.Timiryazeva, 1960, 52,347-55, (Russ.)
In pot and laboratory experiments, seedlings 5-8 cm high were killed by spraying with 750 g/ha 2,4-D amine. Spraying seedlings 10-12 cm high increased their non-protein and protein N contents and improved growth. Older seedlings were less sensitive. When N was applied as $(N^{15}H_4)_2SO_4$, the coefficient of utilization of fertilizer P was 100 times greater than the coefficient for soil P. Spraying seedlings at least 10 days old increased P uptake from soil P and fertilizer P. Spraying increased the numbers of ammonifiers, nitrifiers and cellulose-decomposing micro-organisms in the soil. - Soils & Fert., 24,896.

764. VOROBEV, F.K. and ABUEVA, A.A. [Effect of 2,4-D on some agrochemical properties of sod podzolic soil.] Dokl. s-kh. Akad.Timiryazeva, 1958, 39,148-55, (Russ.)
Toxicity of 2,4-D to cereals and flax is alleged to have decreased more rapidly in soil receiving NPK than in unfertilized soil. Nitrification and ammonification were increased by 2,4-D. The length of time for which the N in $(NH_4)_2SO_4$ remained available was increased by 2,4-D. Soils & Fert., 24,986.

765. BELL, G.R. (Fisheries Res.Bd, Biol.Sta., Nanaimo, British Columbia, Canada). Studies on a soil Achromobacter which degrades 2,4-dichlorophenoxy-

acetic acid. Canad.J.Microbiol., 1960, 6, 325-37.
Cells of Achromobacter sp. possessed what appeared to be an adaptive system able to oxidize a wide variety of 2,4-D analogues. The system was most active at 30°C, at or below pH 6.0 and in barbital buffer. - Soils & Fert., 23, 2590.

APPLICATION AND MACHINERY

See also 684.

766. COURSHEE, R.J. and IRESON, M.J. (Hort.Eng.Dep.,N.I.A.E.,Wrest Park,Silsoe, Beds.,England). Investigations on spray drift. III. The range of projection of small drops. J.agric.Engng Res., 1961, 6,(1),59-63, figs.6,tabs.2,bibl.9.
Drops of water of a known size were projected horizontally at various initial speeds through the air and the distances which they travelled horizontally before coming to rest were measured. The ranges found were in close agreement with those predicted for semiturbulent airflow past the drop. It was shown that the maximum range attainable with drops of conventional sizes was of the order of 1 m. - Authors' Summary. [O.W.]

767. ASHWORTH, R. de B. and LLOYD, G.A. (Plant Pathol.Lab.,Hatching Green,Harpenden, Herts.,England). Laboratory and field tests for evaluating the efficiency of wetting agents used in agriculture. J.Sci. Fd Agric., 1961, 12,(3),234-40, bibl.6.
In preliminary tests, leaf wettability decreased in the following order: nettle [Urtica sp.] and laurel [Laurus sp.], apple, chrysanthemum [Chrysanthemum sp.], pear, broccoli, dandelion [Taraxacum officinale] and cabbage. In tests with cabbage (var. January King), as plants increased in age, the number of leaves which were difficult to wet rose also. Wilted leaves were more wettable than unwilted and the upper more than the lower surfaces of leaves. The youngest leaves at the stem apex and the oldest leaves at the stem base showed greater wettability than the relatively large leaves in intermediate positions. In studies of field tests to determine wettability, reliable visual evaluations of the percentages of areas of cabbage leaves wetted by dipping could be secured only where 5 or 95% of the surface was wetted and, for the purposes of comparing different wetters, a concentration of wetter which would give 100% wetting (just) was selected. A procedure for the dip-testing of different wetters is given. In comparisons of the dip technique with high-volume spraying, where >75% of the leaf surface was wetted, results with either method were similar. Spraying gave rather better wetting than dipping, particularly where concentrations of wetter were low. In laboratory tests, a modified Shapiro's cotton tape test (described) was effective for evaluating anionic and non-ionic wetters and gave results in close agreement with those of dip tests. Test methods based on the wetting of artificially prepared surfaces (carnauba wax) were unsatisfactory.
The limits of the modified cotton tape test are indicated in some detail. All that is claimed for the technique is that it will show in the laboratory whether or not a particular leaf will or will not be wetted by high-volume sprays in the field. - P.J.B. [O.W.]

768. ARCENEAUX, L.L. New field sprayer-duster tested in Louisiana. Sugar J., 1960, 22,(2),30.
The Hahn Hi-Boy Sprayer-Duster (standard size) was used successfully for spraying 2,4-D to control tie vine [Jacquemontia tamnifolia] in sugar cane, and for dusting endrin granules, and in both cases the machine covered 103 ac in a 10-hour day. When fitted with a new type of hopper it is anticipated that it will cover 125 to 130 ac in a 10-hour day. The general features and specifications of the machine are listed. - J.W.F. [L.EB.]

769. PETERS, M. Row crops put safely in the ground. Fmr & Stk Breed., 1961, 74,(3713), 75, figs.3.
See Weed Abstr., 10,174. [O.W.]

770. WHIFFIN, H.J. (Loddington Farm, Linton,nr.Maidstone,Kent,England). Modern herbicides can be applied with precision. Comm.Grower, 1961,(3403),715,717, figs.2.
The inventor describes a prototype device for the accurate delivery of a known amount of spray which has proved valuable in the control of grasses round the bases of fruit trees. The device can be inserted in any spray lance in place of the normal tap and can be pre-set to deliver any quantity from 1 fluid oz to 1 pint each time the tap is opened. - H.A. Roberts. [O.W.]

771. WESTMORELAND, W.G. and FERGUSON, J.C. Drop nozzles for weed sprayers. Ext.Folder N.Carolina agric.Ext.Serv., 1960, 182, pp.2, figs.4.
Brief details are given of different nozzle systems for use with drop nozzle attachments. - P.J.B. [47(75.6)]

772. YATES, W.H. and ASHTON, F.M. (Univ. California, Davis, U.S.A.) Logarithmic dosage sprayer. Agric.Engng, St.Joseph Mich., 1960, 41,(7),436-8,442.
The design, components, construction, calibration and operation of a simple, lightweight logarithmic dosage sprayer are described. Some typical results obtained with the sprayer in the field are given. - P.J.B. [203(79.4)]

773. STARKER, C.H. (Gandy Co.Inc., Owatonna, Minnesota, U.S.A.) Strides in machines for granular chemicals. West.Farm Equip., 1960, 57,(4),24-5, figs.4.
Includes 4 illustrations of "Gandy" units for granular application attached to planters and the names of the distributors in the United States. - D.M.L.S. [32(77.6)]

774. DANIELSON, L.L. (Weed Invest., Hort. Crops., Agric.Res.Serv., U.S.Dep.Agric., Beltsville, Maryland, U.S.A.) An improvement in the Beltsville Granular Herbicide Distributor described in USDA Publication ARS 34-11 (January 1960). Publ.Weed Invest., Hort.Crops., U.S.Dep.Agric., (n.d.), pp.1, figs.2.
The simple improvement described entails cutting a 0.25 in. opening on the delivery side of each delivery slot. The modification reduces the "pulsing" effect in the granule delivery often experienced with present models of the Beltsville granular herbicide distributor. - P.J.B. [111(75.1)]

PHYSIOLOGY, MORPHOLOGY AND ANATOMY

775. VOEVODIN, A.V. and ANDREEV, S.V. (All-Union Inst.Plant Protection). [Absorption of 2,4-D by the leaves of wild plants.] Dokl.Akad.Nauk SSSR, 1960, 134,(1),211-13, (Russ.).
The author studied the absorption by leaves of an 0.8% solution of 2,4-D (sodium salt) and its translocation within the plant by means of labelled C (0.016 mc/ml). There is evidence that while weed species differ in regard to the amount of 2,4-D they absorb, dicotyledons absorb the substance more actively than do grasses. Moistening the leaves with 15% OP-7 (a wetting agent), in addition to 2,4-D, increases absorption of the herbicide, and an addition of diesel oil (0.5-1%) improves the translocation of 2,4-D to the roots. High doses of 2,4-D [e.g. 1.5 kg/ha] impair such translocation, prevent destruction of weed roots and lower the herbicide's efficiency. - Herb.Abstr., 31,240.

776. KURSANOV, A.L. (K.A.Timiryazeva Inst. Plant Physiol., USSR Acad.Sci., Moscow). The transport of organic substances in plants. Endeavour, 1961, 20,(77),19-25. figs.5, tabs.5, bibl.34.
A general review is given of the present state of knowledge of the transport of organic substances in plants, with special reference to recent research in the USSR. - P.J.B. [O.W.]

777. SHEETS, T.J. (Univ.California, Davis, U.S.A.) Uptake and distribution of simazine by oat and cotton seedlings. Weeds, 1961, 9,(1),1-13, bibl.16.
In the experiments reported simazine labelled with ^{14}C in the ring was used in solution cultures to study: (a) the grass uptake and translocation of simazine in oats and cotton seedlings, (b) the relation between the concentration of simazine in the culture solution and the amount absorbed and translocated, (c) the effect of temperature on absorption and translocation of simazine, (d) the relation between the amount of simazine in the leaves and total transpiration, and (e) the metabolic changes of simazine in plant tissues. Simazine was distributed throughout oat seedlings within 3 hours of exposure of the roots to solutions containing 0.1 p.p.m. simazine and accumulation at the leaf tips began within 48 hours. C^{14} accumulated most in the older parts of leaves and the pattern of accumulation was identical to the basipetal development of symptoms of injury. Absorption of simazine and translocation of ^{14}C were greater at 37°C than at 26°C and at a constant temperature of 37°C, were greater at 33% relative humidity than at 66%. For similar treatments, the concentration of simazine of ^{14}C in oat plants was approximately 3 times as high as in cotton plants; this difference appeared to be

related to differences in transpiration rate. Measurable amounts of absorbed simazine were metabolized during the 24-hour exposure period and the rate of breakdown was more rapid in roots than stems. - P.J.B. [O.W.]

778. CARTER, M.C. and NAYLOR, A.W. (For.Dep.Auburn Univ.,Alabama,U.S.A.) Metabolism of 3-amino-1,2,4-triazole-5-C^{14} in plants. Bot.Gaz., 1960, 122,(2),138-43, figs.1,tabs.2,bibl.13.

1. The translocation and metabolism of amitrole-5-C^{14} was studied in bean plants. Entry, movement and metabolic breakdown were all rapid. Some 13 different compounds were found to have derived label from amitrole.

2. No amitrole-5-C^{14} was detected in the terminal growth of bean plants following application to 1 primary leaf. Large quantities of radioactivity accumulated in the terminal growth, but most of this was in the form of an unknown compound designated "1".

3. Compound "1" was found to be the principal metabolic product of amitrole-5-C^{14} in lucerne, honeysuckle, maple and beans. It may be inferred to be involved in the phytotoxic action of amitrole, since amitrole itself did not reach the terminal meristem where the most drastic symptoms following foliar application are usually noted. - From Author's Summary (modified). - D.M.L.S. [O.W.]

779. CARTER, M.C. and NAYLOR, A.W. The effect of 3-amino-1,2,4-triazole upon the metabolism of carbon labeled sodium bicarbonate, glucose, succinate, glycine, and serine by bean plants. Physiol.Plant., 1961, 14,(1),62-71, tabs.5,bibl.17.

Amitrole was found to have very little effect upon the metabolism by bean plants of carbon labelled sodium bicarbonate, succinate-2,3-C^{14} or glucose U-C^{14}. Its effect upon the metabolism of glycine-1-C^{14}, glycine-2-C^{14}, glycine-U-C^{14} and serine-U-C^{14} was quite striking; in the presence of amitrole a high % of radioactivity from these labelled compounds entered an unidentified compound (compound "1") previously reported to be a metabolic product of amitrole. Compound "1" does not appear to be an iron chelate or a sugar adduct. It may possibly be 3-amino-1,2,4-triazolyl-alanine but this too appears unlikely. It is postulated that the phytotoxicity of amitrole may result in part from interference in the normal metabolism of glycine and serine. - D.M.L.S. [O.W.]

780. CARTER, M.C. and NAYLOR, A.W. Studies on an unknown metabolic product of 3-amino-1,2,4-triazole. Physiol.Plant., 1961, 14,(1),20-27, figs.2,tabs.4,bibl.12.

The product, designated compound "1", was biosynthesized, isolated, and subjected to several chemical and physical tests. It was found to be a "zwitterion"; it gave all of the colour reactions to which amitrole reacted positively; and it was ninhydrin-positive. Prolonged hydrolysis of compound "1" resulted in only partial breakdown; amitrole was recovered under these conditions, but the other hydrolytic products have not been identified. Compound "1" was not metabolically changed by beans in 24 hours and appeared to be non-phytotoxic. - Author's Summary (modified). - D.M.L.S. [O.W.]

781. SUND, K.A. and LITTLE, H.N. (Exp. Sta.,Hawaiian Sugar Planters' Assoc., Honolulu,Hawaii). Effect of 3-amino-1,2,4-triazole on the synthesis of riboflavin. Science, 1960, 132,(3427),622, tabs.1,bibl.4.

The production of riboflavin by *Eremothecium ashbyii* is appreciably reduced by amitrole at concentrations which do not inhibit growth. Maize and pea leaf tissues which are albinistic as a consequence of treatment with amitrole have a greatly reduced riboflavin content. - Authors' Summary (modified). - D.M.L.S. [O.R.]

782. WOLF, F.T. (Dep.Biology,Vanderbilt Univ.,Nashville,Tennessee,U.S.A.) Influence of amino triazole on the chloroplast pigments of wheat seedlings. Nature, Lond., 1960, 188,(4745),164-5, figs.2,tabs.1, bibl.7.

Experiments are described in which the net rate of chlorophyll synthesis was drastically reduced by amitrole. There appeared to be no direct action of amitrole on the rate of chlorophyll destruction, at least in darkness. The effects of amitrole on plastid pigments appeared to be secondary to its effect on the plastid itself. - J.W.F. [O.W.]

783. BACH, M.K. and FELLIG, J. (Res.Dep., Union Carbide Chem.Co.,South Charleston, W.Virginia,U.S.A.) Correlation between inactivation of 2,4-dichlorophenoxyacetic

acid and cessation of callus growth in bean stem sections. Plant Physiol., 1961, 36,(1),89-91, figs.1,tabs.2,bibl.4.

Results are presented which correlate the cessation of growth of excised bean stem sections treated with 2,4-D with the disappearance of free 2,4-D from the sections. The radioactivity from C^{14}-carboxyl labelled 2,4-D largely remained in the tissue in an ethanol-soluble form chromatographically distinct from 2,4-D, and only relatively small amounts of radioactivity were found in CO_2 or were released into the medium. - Authors' Summary.

[O.W.]

784. * BUTENKO, R.G. and BASKAKOV, Yu.A. (USSR Acad.Sci.,Moscow). [On the mechanism of the effect of maleic hydrazide on plants.] Fiziol.Rast., 1960, 7,385-94, (Russ.e.), bibl.29.

785. BAKER, J.E. (Bot.Dep.,State Coll., Raleigh,N.Carolina,U.S.A.) A study of the action of maleic hydrazide on processes of tobacco and other plants. Physiol. Plant., 1961, 14,(1),76-88, figs.1,tabs.6, bibl.25.

The data reported are taken from the Ph.D. Thesis of the author (see Weed Abstr., 8, 1771). It was shown, inter alia, that the degree of inhibition of oxygen uptake by tobacco tissues caused by MH at concentrations of 0.01 M and above depended on the pH of the MH solution bathing the tissue. At pH values near 7.0 an inhibition of 10-20% occurred during the first hour, while at pH 4.0 the inhibition increased to 30-50%. Although the effect is quite distinct from the action of MH on mitosis at very low concentrations, it could assume importance in high dosage application, as in tobacco sucker control. - From Author's Summary (modified). - D.M.L.S. [O.W.]

786. FAWCETT, C.H., WAIN, R.L. and WIGHTMAN, F. (Agric.Res.Council Unit Plant Growth Subs. & Syst.Fungicides,Wye College, Univ.London,England). The metabolism of 3-indolylalkanecarboxylic acids and their amides, nitriles and methyl esters in plant tissues. Proc.roy.Soc.B., 1960, 152,231-54, figs.12,tabs.2,bibl.25.

The plant growth-regulating activity of homologous series of ω-(3-indolyl)alkanecarboxylic acids, their methyl esters, amides and nitriles was assessed in wheat-cylinder, pea curvature and pea-segment tests. In wheat tissue, all homologues were active except 3-indolecarboxylic acid and its corresponding ester, amide and nitrile. These compounds, together with the propriobutyro-, valero and capro-nitriles were inactive in pea tests. There was strong evidence that β-(3-indolyl)propionic acid is itself a plant growth hormone and not a hormone precursor, and that β-oxidation of this compound within plant tissue to 3-indolecarboxylic acid is hindered. The formation of either 3-indolylacetic or β-(3-indolyl)propionic acids from alternate homologues in the acid series is fully consistent with degradation of the side-chain by β-oxidation. All esters and amides except 3-indoleamide were readily converted within the test tissues to the corresponding acids and their activity is explicable on this basis. With the nitriles in wheat tissue, the results indicated that the terminal -CN is hydrolyzed to —COOH with all homologues except 3-indole nitrile. In pea tissue, however, only 3-indolylacetonitrile was hydrolyzed in this way. Evidence for α-oxidation was obtained with wheat with all homologues except 3-indolenitrile. In pea tissue, however, only 3-indolylacetonitrile and ζ-(3-indolyl)heptanonitrile were so degraded. The mechanisms underlying oxidative breakdown of the side-chain of these indole homologues are discussed. The results are shown to give further evidence for β-oxidation of acids and α-oxidation of nitriles within plant tissues and it is also suggested that with longer chain lengths, nitriles may also be subject to ω-oxidation. - From Summary. - P.J.B. [460(42)]

787. ÅBERG, B. (Inst.Plant Physiol.,Roy. Agric.Coll.,Uppsala,Sweden). Studies on plant growth regulators. 17. Some thiocarbamic acid derivatives. K.Lantbr.Högsk. Ann., 1960, 26,239-50, figs.7,tabs.3, bibl.17.

Ten thiocarbamic acid derivatives containing the dimethyldithiocarbamyl (Tm) or the pentamethylenethiocarbamyl (Tp) group, coupled to $-O.CH_2.COOH$ (OA), $-O.CH(CH_3).COOH$ (OP), $-S.CH_2COOH$ (SA), or $-S.CH(CH_3).COOH$ (SP) were studied in respect of their growth-regulating activity on flax and wheat roots and oat coleoptiles. TmOA and (-)TmOP showed fairly strong and pure auxin activity, while that of TmSA was considerably lower than that of TmOA and an anti-auxin component of its activity was indicated. (+)TmSP were thought likely to belong to the same steric series as (-)TmOP and was mainly auxinic. (-)TmSP and (+)TmOP exerted only

anti-auxin effects. Substituting two methyl groups in TmOA and TmSA by a pentamethylene group conferred anti-auxin activity on the resulting TpOA and TpSA. Also, for both enantiomers of TpOP, only anti-auxin effects were found. It was concluded that the thiocarbamyl compounds could be looked on as analogous to the phenoxyacetic acids and different structural changes resulted in similar changes in the growth-regulating activities of both series of compounds. - From Summary. - P.J.B. [O.W.]

788. WEAVER, R.J. and McCUNE, S.B. (Univ.California,Davis,U.S.A.) Response of Thompson seedless grapes to 4-chlorophenoxyacetic acid and benzothiazole-2-oxyacetic acid. Hilgardia, 1957, 27,(6), 189-200, figs.1,tabs.6,bibl.7. [210(79.4)]

789. HASSALL, K.A. (Dep.Physiol.Chem., Reading Univ.,England). Toxicity of trichloroacetates to Chlorella vulgaris. Physiol.Plant., 1961, 14,(1),140-9, figs. 1,tabs.4,bibl.9.

Some toxic effects of trichloroacetates were investigated using a strain of C. vulgaris which grows readily in the dark with glucose as the source of carbon. Cell division was retarded to the same extent by similar concentrations of toxicant under photosynthetic and non-photosynthetic culture conditions. At concentrations exceeding ca. 0.01 M cell division was retarded, and the proportion of phosphorous compounds which were 'acid soluble' increased in the growing cells. The uptake of external glucose, phosphorous and nitrogen by a concentrated suspension of Chlorella were all depressed by concentrations above 0.06 M, such that the final ratio of cell phosphorous to nitrogen was independent of the trichloroacetate concentration. Respiration, as measured by uptake of oxygen, was not reduced by concentrations below 0.4 M, above which non-specific osmotic effects were probably the cause of respiratory failure. In contrast, 0.001 M TCA decreased respiration of old cells appreciably in an unbuffered medium. - Author's Summary. [O.W.]

790. HASSALL, K.A. (Dep.Physiol.Chem., Univ.Reading,Berks.,England). Effect of monuron and of related compounds on the growth of seedling peas. J.exp.Bot., 1961, 12,(3-4),47-55, figs.3,tabs.4, bibl.13.

Experiments were carried out to show that the inhibition of plant growth caused by monuron was not an indirect effect due to its action on photolysis and that the growth inhibition produced by a range of substituted ureas and thioureas was related to their solubility. Shoots of peas grown in phosphate buffer solution were no more sensitive to monuron applied continuously than were the roots. Shoots, however, were inhibited in growth by contact with monuron for any period of 28 hours between the third and tenth days of growth; main roots, however, were unaffected. Neither roots nor shoots were more sensitive to monuron in light than in darkness, but damage caused by high concentrations of monuron was greatest at times when metabolic activity was at a high level. The phytotoxicity of alkyl and aryl ureas was closely correlated with their solubility in water. The toxicities of a number of ureas substituted with acidic or basic groups was not apparently related to solubility. Nitrourea and hydrazine nitrourea showed high phytotoxicity. It was considered that the aryl- and alkyl-substituted ureas disrupt an integrating surface in exerting their phytotoxic effect, rather than that they act upon specific groups of enzymes. - From Summary. - P.J.B. [O.W.]

791. HOLDEN, D.J. (S.Dakota State Coll., Brookings,U.S.A.) Response of flax to 2,3,5-TIBA. Pap.Flax Inst.U.S., 1959, 27,17.

A brief note is given on the use of 2,3,5-TIBA [rates not stated] for breaking apical dominance in oil-seed flax. Applications after the period of maximum flowering have caused an increase in the number of buds which broke dormancy and thus increased the number of fruit-bearing branches. This so-called "second crop" matured about 10 days later than normally produced seed capsules, where light and moisture were adequate. - P.J.B. [30(78.3)]

792. * ROTINI, O.T. Antimitotic action of cyanamide on bulbs of Allium cepa L. Ric.sci., 1960, 30,842-8.

793. van STEVENINCK, R.F.M. (Crop Res.Div., D.S.I.R.,Christchurch,New Zealand). Factors affecting the abscission of reproductive organs in yellow lupins (Lupinus lutens L.) J.exp.Bot., 1958, 9,372-83,figs.4,tabs.5, bibl.16.

The auxins α-naphthylacetic acid and β-indolylacetic acid, as well as the anti-auxins 2,3,5-triiodobenzoic acid and N-m-tolylphthalamic acid induced flower abscission

when applied in lanilin to the base of the lupin inflorescence, but the pattern of abscission induced by auxins differed from that induced by anti-auxins. All the growth substances seemed to move much more efficiently in the acropetal direction than in the basipetal direction in the flower stalk. The influences of defoliation and of assimilates are discussed. - C.C.McCready. [O.RE.]

794. STARBANOVA, E. [Studies on the enzymes invertase and peroxidase in sunflower seedlings and adult plants in connection with their resistance to broomrape.] Izv. Inst.Rasten.Sofia, 1959, 7,151-62, (Bulg.). Plant Breed Abstr., 31,2454.

795. SALISBURY, F.B. and BONNER, J. (Colorado State Univ.,Fort Collins,U.S.A.) Inhibition of photoperiodic induction by 5-fluorouracil. Plant Physiol., 1960, 35, (2),173-7, figs.7,tabs.1,bibl.9.
Xanthium pennsylvanicum was used as the test plant. - P.J.B. [16(78.8)]

796. DEVLIN, R.M. and JACKSON, W.T. (Bot.Dep.,Dartmouth Coll.,Hanover,New Hampshire,U.S.A.) Effect of p-chlorophenoxy-iso-butyric acid [PCIB] on rate of elongation of root hairs of Agrostis alba L. Physiol. Plant., 1961, 14,(1),40-8, figs.3,tabs.1, bibl.24.
The rate of root hair elongation was increased by PCIB 10^{-13}-10^{-7} M, with maximal stimulation occurring at 10^{-8} M. The rate was slightly reduced by 10^{-6} M, reduced to 70% of the control at 10^{-5} M, and reduced to zero by 10^{-4} M. The rate of elongation of root hairs in PCIB-free medium was constant over the 2-hour treatment period. In contrast to this, the inhibitory effects of 10^{-5} M increased markedly during this interval. However, all other concentrations induced their effects rapidly and these altered rates were maintained.
It is suggested that, until a more complete understanding of the mechanism of action is obtained, plant growth regulators should be defined as auxins, anti-auxins, etc. only in terms of the system studied, and that both indoleacetic acid and PCIB be designated as "root-hair auxins". Whether PCIB should also be characterized as a root-hair anti-auxin remains to be determined. - Authors' Summary (modified). - D.M.L.S. [O.W.]

797. MAEDA, E. (Agric.Fac.,Nagoya Univ., Japan. The effects of growth regulators on the geotropism of leaf sheath basal region in wheat plant. J.exp.Bot., 1958, 9,(27),343-9, figs.8,tabs.4,bibl.13.
2,4-D was one of the compounds tested. - D.M.L.S. [O.RE.]

798. ELIASSON, L. (Forest Res.Inst., Stockholm 51,Sweden). The influence of growth substances on the formation of shoots from aspen roots. Physiol.Plant., 1961, 14,(1),150-6, figs.1,tabs.1, bibl.14.
2,4,5-T, 2,4-D, MCPA and 4-CPA were more active in inhibiting shoot formation from root segments of Populus tremula than NPA, 3-indolylacetic acid, 2,3,6-TBA or amitrole; 2,4,5-T was the most active. The sensitivity to these phenoxy compounds was greatest in the summer when the ability of the segments to form suckers was less than in other seasons of the year. The corresponding α-propionic acids were less active than 2,4-D, 2,4,5-T and MCPA; MCPB had about the same effect as MCPA. An effect on growth after shoot emergence was caused only by 2,3,6-TBA 10^{-3}M which, in addition to inhibiting growth of developed shoots, also caused leaf malformation. Other responses caused by the phenoxy compounds tested were necrotic symptoms associated with rapid microbial decomposition and swelling of tissues in the bark. 2,4,5-T was the most active in inducing the necrosis, and 2,4-D, MCPA and 4-CPA the swelling. 3-indolylacetic acid, NPA and especially 2,3,6-TBA stimulated callus growth at the cut surfaces of the segments, and NPA was active in inducing growth of lateral roots; 2,4-D and MCPA also at low concentrations showed the same symptoms.
The results suggest that there is no correlation between auxin activity and the phytotoxic properties of the phenoxy compounds. - D.M.L.S. [O.W.]

799. FURUYA, M. (Univ.Tokyo,Japan). A biomorphological significance and an analysis of the effects of auxin on the development of composed shoot in bean plants. J.Fac.Sci.Univ.Tokyo, Sect.III, 1958, 7,(7/8),451-70.
2,4-D was the only one of several compounds tested to cause perceptible morphological effects after germination. These are described. - From Plant Sci., 36,2504 (modified). - D.M.L.S.

800. NAITO, N., TANI, T. and KISHI, T. [Antifungal substance production by Gleosporium kaki and Schyzophyllum commune which were grown on media containing 2,4-D.] Tech.Bull.Fac.Agric. Kagawa Univ., 1957, 9,(2),66-72, (Jap.e.)
When G. kaki and S. commune were grown in a culture solution containing 2,4-D, a progressive decrease in the growth rate was caused and an impure fungitoxic substance (yellowish oil) was isolated from the culture filtrates. Growth rate of Cochliobolus miyabeanus when grown in a similar solution was almost invariable and no fungitoxic substance was produced. The inhibitory action of 2,4-D on G. kaki and S. commune is considered to be attributable primarily to the fungitoxic substances rather than to a direct effect of 2,4-D on the causal fungi. - From Plant Sci., 35,64742 (modified). - D.M.L.S.

801. * NAITO, N. [Phytopathological studies concerning phytohormones with special reference to their effect on phytopathogenic fungi.] Mem.Fac.Agric. Kagawa Univ., 1957, 2,1-86, (Jap.e.)

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A herbicidal composition of high selectivity (without having appreciable effect on wheat and maize) comprises an inert carrier and (as active ingredient) 2,5-dichloro-5-nitrobenzoic acid and/or a functional derivative thereof, e.g. salt, ester or amide. The composition may also contain emulsifying agent, sequestering agent, penetrant, extender etc. - Abstr. J.Sci.Fd Agric., 12,i-174.

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Includes brief notes on chemical control of Agropyron repens in orchards; and on the dangers to fruit trees of careless spraying with growth regulator herbicides. - P.C. [O.W.]

807. CAMPBELL, J.D. (Monsanto Chem.Co., St.Louis,Missouri,U.S.A.) Weed control.... Amer.Veg.Grower, 1961, 9,(4),48-9.
An annotated list of herbicides in common use and under test, with brief indications of rates of application, weeds killed and vegetable crops in which they can be employed. - H.A. Roberts. [HVRS]

808. MUHLETHALER, P. MCPB- und CMPP-Präparate zur selektiven Unkrautbekämpfung. [MCPB and mecoprop preparations for selective weed control.] Schweiz.Landwirt.Monh., 1960, 38,(4),194-7, tabs.2.
Some of the more commonly used growth regulator herbicides are listed on the basis of their active principle - 2,4-D, MCPA, 2,4,5-T, MCPB and mecoprop. The results of

16 experiments covering the years 1957-9 are expressed in the form of tables showing the percentage kill obtained with these herbicides on the following weeds: Galeopsis tetrahit, Polygonum spp., Galium aparine, Sinapis arvensis, Chenopodium album, Papaver rhoeas, and Cirsium spp. - P.C. [36(494)]

809. WIEBE, G.A. and HAYES, J.D. (Crops Res.Div.,Agric.Res.Serv.,U.S.Dep.Agric., Beltsville,Maryland,U.S.A.) The role of genetics in the use of agricultural chemicals. Agron.J., 1960, 52,(12),685-6, figs.1,tabs.1,bibl.4.
The results are given of investigations of the reaction of 107 spring and 53 6-row winter barleys to DDT. The overall frequency of resistant varieties was approximately 10%, but was much higher in 2-rowed than 6-rowed types and was controlled by a single, major recessive gene. It was concluded that more emphasis should be paid to the role of genetics in endowing crops with protection both from pests and chemicals which control them. - P.J.B. [110(75.2)]

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815. RIOS, P. Importancia economica de los herbicidas. [Economic importance of herbicides.] Ingen.agron.(Venezuela), 1960, 4,20-2, (Span.), figs.2,tabs.2.
Includes a list of the herbicides currently used in Venezuela in sugar cane, maize, potatoes, carrots, cotton, onions and citrus. - D.M.L.S. [8(87)]

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A review of the Proceedings. - P.J.B. [O.W.]

List of Common Names and Chemical Abbreviations

The following list based on that adopted by the Weed Society of America, has been approved by the British Weed Control Council, except for those marked □.
An asterisk (*) signifies common names approved by the B.S.I.
A plus sign (+) signifies approval by the Weed Society of America.

amiben □+	3-amino-2,5-dichlorobenzoic acid
amitrole □+	3-amino-1,2,4-triazole
AMS □+	ammonium sulphamate
atrazine □+	2-chloro-4-isopropylamino-6-ethylamino-1,3,5-triazine
barban □	4-chloro-2-butynyl-N-(3-chlorophenyl)carbamate
CDAA +	2-chloro-NN-diallylacetamide
CDEA +	2-chloro-NN-diethylacetamide
CDEC +	2-chloroallyl-NN-diethyldithiocarbamate
chlorpropham *	isopropyl-N-(3-chlorophenyl)carbamate
4-CPA +	4-chlorophenoxyacetic acid
4-CPB	4-(4-chlorophenoxy)butyric acid
2,4-D +*	2,4-dichlorophenoxyacetic acid
3,4-DA +	3,4-dichlorophenoxyacetic acid
dalapon +*	2,2-dichloropropionic acid
2,4-DB *	4-(2,4-dichlorophenoxy)butyric acid
DCU □+	dichloralurea
2,4-DEB +	2,4-dichlorophenoxyethyl benzoate
2,4-DES *	2,4-dichlorophenoxyethyl hydrogen sulphate
diallate	2,3-dichloroallyl diisopropylthiolcarbamate
dichlone +*	2,3-dichloro-1,4-naphthoquinone
dinosam *	2-s-amyl-4,6-dinitrophenol
dinoseb *	2-s-butyl-4,6-dinitrophenol
diquat +*	1,1'-ethylene-2,2'-bipyridylium-2B
diuron +*	N-(3,4-dichlorophenyl)-N'N'-dimethylurea
DMTT □+	3,5-dimethyltetrahydro-1,3,5,2H-thiadiazine-2-thione
DNOC *	2-methyl-4,6-dinitrophenol or 3,5-dinitro-o-cresol
2,4-DP	2-(2,4-dichlorophenoxy)propionic acid
endothal +	3,6-endoxohexahydrophthalic acid
EPTC □+	ethyl-NN-dipropylthiolcarbamate
erbon +	2-(2,4,5-trichlorophenoxy)ethyl-2'2'-dichloropropionate
fenac □+	2,3,6-trichlorophenylacetic acid
fenuron +*	N-phenyl-N'N'-dimethylurea
ipazine □+	2-chloro-4-diethylamino-6-isopropylamino-1,3,5-triazine
MCPA +*	4-chloro2-methylphenoxyacetic acid
MCPB *	4-(4-chloro-2-methylphenoxy)butyric acid
MCPES +	sodium 4-chloro-2-methylphenoxyethyl sulphate
mecoprop *	dl 2-(4-chloro-2-methylphenoxy)propionic acid
MH □+	maleic hydrazide
monuron +*	N-(4-chlorophenyl)-N'N'-dimethylurea
neburon +	N-(3,4-dichlorophenyl)-N'-butyl-N'-methylurea
NPA +	N-1-naphthylphthalamic acid
paraquat	1,1'-dimethyl-4,4'-bipyridylium-2B
PCP +	pentachlorophenol
PMA +	phenylmercuric acetate
propazine □+	2-chloro-4,6-bis(isopropylamino)-1,3,5-triazine
propham *	isopropyl-N-phenylcarbamate
simazine +*	2-chloro-4,6-bis(ethylamino)-1,3,5-triazine
SMDC □+	sodium methyl dithiocarbamate
2,4,5-T +*	2,4,5-trichlorophenoxyacetic acid
2,4,5-TB	4-(2,4,5-trichlorophenoxy)butyric acid
2,3,6-TBA +	2,3,6-trichlorobenzoic acid
TCA +	trichloroacetic acid
2,4,5-TES +	sodium 2,4,5-trichlorophenoxyethyl sulphate
2,4,5-TP	2-(2,4,5-trichlorophenoxy)propionic acid
trietazine □+	2-chloro 4-diethylamino-6-ethylamino-1,3,5-triazine

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